Ask your Jobber or Write for Free Copies of our latest Cumulative Index and "How to File" Folders

TRADE NAME	MODEL	SET AND FOLDER NO.
Emerson	635 (Ch. 120108)	92-1
Fada	855	92-2
Hallicrafters	518, 519, 520, 521, 600, 601, 602, 603, 604 Tel. Rec.	92-3
Motorola	10T2, 10VK12, 10VK22, 10VT10, 10VT24 (Ch. TS14, A, B), 12K1, 12K2, 12T1, 12VF4, 12VF26, 12VK11, 12VT13 (Ch. TS23, A, B) Tel. Rec.	92-4
Philco	49-1040 (Code 123), 49-1076 (Code 123), 49-1077 (Code 122), 49-1150 (Codes 122, 124), 49-1175 (Codes 122, 124), 49-1240 (Code 124), 49-1278 (Code 123), 49-1279 (Code 122), 49-1280 (Code 121) Tel. Rec.	92-5
Sparton	141A (Ch. 8L10), 4970, 4971, 4972 (Ch. 8S10)	92-6
Starrett	Henry Hudson, Henry Parks, Robert E. Lee Tel. Rec.	92-7
Sylvania	1-075, 1-113, 1-114, 1-124, 1-125 (Ch. 1-139), 1-177 (Ch. 1-186) Tel. Rec.	92-8
Videola	VS-160, VS-161, VS-165, VS-167, VS-168 Tel. Rec.	92-9

The PHOTOFACT Servicer

April 15, 1950 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ Vol. No. 10, Nos. 91 & 92

NEW - 1950!
Additions to
RMA Production Source Code

(For Reference - See PHOTOFACT Servicer, Set No. 70)

We suggest you mark this Servicer in Set No. 70 as follows: "For Numbers 622 to 654, inclusive, see Photofact Servicer Set No. 92."

Code No.	Company
622	*Mifflinburg Body Works, Inc., Mifflinburg, Pa.
623	Anchor Radio Corp., Chicago 23, Ill.
624	Surprenant Mfg. Co., Boston 8, Mass.
625	*The Orsenigo Co., Inc., Westerly, R. I.
627	*Churchill Cabinet Co., Chicago 47, Ill.
628	Davis Electric Co., Cape Girardeau, Mo.
629	*Anchor Plastics Co., New York 13, N. Y.
630	Magnetic Corp. of America, Chicago 22, Ill.
631	Pickering & Co., Inc., Oceanside, N. Y.
632	*El-Rad Mfg. Co., Chicago 13, Ill.
633	American Tel., Inc., Chicago 5, Ill.
634	*Todd Products Co., Inc., Mt. Vernon, N. Y.
635	*Todd-Tran Corp., Mt. Vernon, N. Y.
636	Sheldon Elec. Co., Div. of Allied Electric Products, Inc., Irvington 11, N. J.
637	Central Coil Co., Inc., Indianapolis 22, Ind.
638	Industrial Development Engineering Associates, Inc., Indianapolis 4, Ind.
639	Johnson & Hoffman, Inc., Rockville Centre, N. Y.
640	Northern Metal Pro. Co., Chicago, 24, Ill.
641	Caliri Mfg. Co., West Orange, N. J.
642	Mycalex Corp. of America, Clifton, N. J.
643	National Aeronautical Corp., Ambler, Pa.
644	General Railway Signal Co., Rochester 2, New York
645	Alamo Tel. & Radio Co., San Antonio, Tex.
646	R. K. L. Electro Winding Corp., Delevan, N. Y.
647	American Structural Pro. Co., Sub. of Owens-Illinois Glass Co., Toledo 1, O.
648	*American Radionic Co., Inc., Brooklyn 17, New York
649	Electro-Voice, Inc., Buchanan, Mich.
650	Central Commercial Co., Chicago 4, Ill.
651	*Jewel Radio Corp., Long Island City 1, New York
652	*Scharr Elec. Co., West Hartford, Conn.
653	Wind Turbine Co., West Chester, Pa.
654	Square Root Mfg. Corp., Yonkers 3, N. Y.

* Indicates non RMA members.

LOOK! WHAT'S COMING!

Martin Codel's TELEVISION DIGEST Trade Report of February 25th, reads:

"GE'S 24-in. & PICTURE TUBE TRENDS: Now it can be told that GE will have 24-in. metal-coned picture tube by next summer - - very likely in receivers of own as well as for sale to tube accounts. That's all we can verify, and that fact is probably how report got around that 21-in. or larger tubes were on way (Vol. 6:4). That and FCC chairman Coy's statement before House appropriations subcommittee to effect that TV receivers with 22-in. will be marketed 'within the next few months'.

"Besides GE, others experimenting with larger tubes - - up to 30-in. reported, unofficially - - are DuMont, Lansdale (Philco), Rauland (Zenith) and RCA. But none will say how nearly ready they are, though it won't be surprising if Zenith comes forth with something such soon, probably rectangular.

"Significant thing is trend betokened - - ever-larger tubes, whether glass or metal. This year looks like big one not only for 12-1/2-in. receivers, but also for 16 & 19-in. which the major set-makers are selling as fast as they can produce. Biggest 19-in. tubemaker DuMont is now turning out 25,000 per month for own and other manufacturers' sets, and constantly increasing rate of production."

WE'LL PAY $5.00 FOR YOUR IDEAS ON NEW WAYS TO USE PHOTOFACT FOLDERS

Have you found some novel way of putting your PHOTOFACT Folders to work so you get extra value and help from them? Tell us about it, and if the idea is good enough to pass on to thousands of your fellow PHOTOFACT subscribers, we'll print it in the "Servicer" and send you a crisp $5.00 check. Here's one well worth $5.00. Mr. Clarence Whiter, Ilion, New York, writes:

> "When we replace a part in a receiver covered by a PHOTOFACT Folder, we encircle the part on the PHOTOFACT Schematic and on the picture of the chassis in red pencil. This serves as a reminder to check these parts first, the next time we service a like set. Usually this locates the trouble instantly and saves an infinite amount of time."

Got a hint or kink to match this - - some other ingenious way in which you use PHOTOFACT Folders? Send in your ideas - - they may be worth $5.00 each. Start 'em coming!

Address your letters to Ann Jones, c/o PHOTOFACT Servicer.

* * *

BOOK REVIEW

TELEVISION SERVICING FOR RADIOMEN, by H. P. Manly. 8-1/2 x 11. Bound. List Price $4.00. 406 pages illustrated. Publisher, Frederick J. Drake & Co., Wilmette, Illinois.

This book has been essentially written for Trade School use and assumes a certain amount of familiarity with elementary radio principals. It starts with an explanation of the television picture makeup, interprets these requirements in terms of an electronic television signal, and proceeds on through the various detecting, amplifying, and synchronizing circuits necessary in present television receivers.

The text is generally good. Illustrations could be improved. All in all the book is worth the price asked for it and should prove interesting to those engaged in Television Servicing.

* * *

FIELD EXPERIENCES

For every "Field Experience" published, we issue a certificate good for one PHOTOFACT Folder Set. Awards are issued at the time of publication. Since it is impossible to verify the accuracy of contributions, we cannot be responsible for either the diagnosis made of the receiver trouble, or the results which will be obtained by following the suggested repair routine. All contributions become the property of Howard W. Sams & Co., Inc.

* * *

PHILCO Model 49-904
Photofact Set No. 58, Folder No. 16

Complaint: Low volume.

Cause: Voltage check will reveal only a slight change of approximately 10 volts less than plate supply.

Remedy: The important check is bias voltage for the 12AV6 which reveals bias abnormally high at cathode. Trouble is capacitor (Item No. 22), value 220 MMFD. with high leakage.

Dodd Radio & Electrical Service
11 North Second Street
Lewisburg, Penn.

* * *

ARVIN Model No. 140-P
Chassis RE-209
Photofact Set No. 25, Folder No. 6

Complaint: Squeals when stations tuned in, particularly on low end. Realignment makes condition worse. Filter capacitors O. K.

Remedy: Replace 100 MFD. filament capacitor (Item No. 7).

Note: You can make your customer happy when his OY4 rectifier tube ($4.90 list) goes bad. Just take an old octal tube base and install a selenium rectifier stack, such as a Federal 403D2787, on it. The positive side of the rectifier goes to pin No. 7 of the tube base, and the negative side to pin No. 5. No changes in resistor values were necessary. The filament voltage checked "on the nose" with a vacuum tube voltmeter.

GENERAL ELECTRIC Model No. 202
Photofact Set No. 8, Folder No. 15

Complaint: Low output. High hum level.

Remedy: Checked tubes, replacing dead 12SQ7 and 12SG7. Output was restored, but this left a tunable hum, audible with volume control turned

all the way down. Presence of stations was marked by a hum peak, although the volume control was at too low a setting to make the program audible. Tried several remedies, to no avail. Finally switched tubes one by one. Success! The 12SK7 was the guilty one. Not even a good dynamic mutual conductance tube checker could find anything wrong with the tube, however.

CROSLEY Model 52TM
Chassis 74

Complaint: Weakens 12SK7's prematurely. (Two months.)

Remedy: Replace 0.022 MFD. blocking capacitor between pin No. 5 (cathode) of 12SK7 and secondary return of 1st IF transformer with 0.02 MFD. 600 volt plastic sealed capacitor.

Editor's Note: All three above experiences were submitted by:

Lincoln Radio Service
2128 S. W. 3rd Ave.
Portland, Oregon

* * *

MOTOROLA Models VK-101 & VF-102
TS-7 Chassis
Photofact Set No. 51, Folder No. 14

Complaint: No control over focus and "Brightness" controls.

Cause: Shorted or badly leaking C-99, .05 MFD. in the plate circuit of the 6AC7 2nd video amplifier.

Remedy: Replace the condenser with a 600 volt unit.

Also on this same set:

Complaint: Insufficient brilliance on picture tube and picture intermittent.

Cause: Leaky or shorted C-121, .05 MFD.

Remedy: Replace unit with a 600 volt rating. I find that the newer oil-impregnated bypass condensers are best for replacing these two important units.

The above symptoms apply also to the later chassis, TS-9, TS-9A, TS-9B, and TS-9C, as covered in Photofact Set No. 67.

Horace D. Westbrooks
Box 281
Griffin, Georgia

EMERSON Model 603
AM-FM Phono.
Photofact Set No. 73, Folder No. 4

Complaint: Set played O. K. on AM and Phono. but on FM power transformer got hot. Filter capacitor checked O. K. Filter choke also was hot.

Remedy: Trouble was traced to capacitor (Item C19), which was shorted. This original is a 400 volt .01 MFD. unit. Replaced with a 600 volt .01 MFD. unit. Item No. R13 was warm and had also changed in value, so was replaced. C19 is at end of band switch to rear of chassis, one unused terminal of switch used as tiepoint for C19 and R13, other end of C19 going to ground.

Albert E. Haskell
2107 N. Clark Street
Chicago 14, Illinois

* * *

SENTINEL Model 285P
Photofact Set No. 6, Folder No. 27

Complaint: Fading on ac. Fading occurred every two or three minutes and set was dead for only 10 seconds and then would operate normally. When chassis was taken out of cabinet for inspection, fading stopped.

Cause: Heating entire chassis with 200 Watt sun lamp caused set to cut out. Checking voltages showed 90 volt positive on grid of 3Q5. Screen was apparently shorting to grid when tube was heated. The 3Q5 is next to the 117Z6 and gets a heat treatment when set is used in ac.

Remedy: A new 3Q5 and increased ventilation cured this condition.

Michael Unger
Michael's Radio & TV Service
121-10-133 Street
South Ozone Park, N. Y.

* * *

SENTINEL Model 316P
Photofact Set No. 48, Folder No. 22

Complaint: Works O. K. on ac but distorted on battery.

Remedy: Check the wiring from the batteries to the ac-dc-battery switch. There may be too much strain on some of the leads making a poor contact in the switch. The A+ lead is the

worst one. By allowing slack in the wire and resoldering, reception will be normal on battery operation again.

PHILCO Model 46-350
Photofact Set No. 10, Folder No. 24

Complaint: Intermittent operation and distortion.

Remedy: Check the RF coil (Item No. 47). We've found a couple that had poor electrical connections inside the RF can. Clean and resolder all these connections and realign set.

PHILCO Model 46-420
Photofact Set No. 6, Folder No. 22

Complaint: Very weak.

Cause: Although the speaker section seemed to be at fault, the actual trouble was the grid bypass capacitor (Item No. 17) which shorted out.

Remedy: Replace capacitor.

CORONET Model C-2 (using 1.4 volt tubes)
Photofact Set No. 6, Folder No. 8

Complaint: Set would not operate at the high end of its tuning range.

Cause: After extensive checking it was found that the lead to pin No. 5 of the 3Q4 (filament center tap) was making a poor connection causing the tube to cut off at this high frequency.

Remedy: Resolder connection.

Editor's Note: All four above experiences were submitted by:

Schwinck Radio Service
West Point, Nebraska

* * *

AIRLINE Model 84BR - 2733A

Complaint: Intermittent tunable hum.

Cause: Trouble is due to poor ground connection at the two tube sockets on the tuner sub-chassis. Correct by bonding all ground connections together at each tube socket and run heavy ground lead from each socket directly to main chassis.

Clarence Pearson
Pearson Radio Service
Reynolds, Illinois

* * *

MOPAR Model 805 (Philco Model C4908)
Photofact Set No. 71, Folder No. 11

Complaint: Intermittent operation, followed by slight drift.

Remedy: Check poorly soldered connections on L5 and L6, oscillator and oscillator shunt coil. This trouble has been found in several C4908 models. Center tap connection to 6BE6 oscillator grid will usually be found to be open.

R. A. Neal Radio & Television
12 West Wellsboro Street
Mansfield, Penn.

* * *

TRUETONE Model D-1846A
Photofact Set No. 40, Folder No. 23

Complaint: Continuous grinding noise.

Cause: Defective RF plate bypass from 6AT6 tube.

Remedy: Replace 220 MMF. capacitor with a new unit of the same type.

Chester Ludwick
Okmulgee, Okla.

* * *

HALLICRAFTERS Model T-67
Photofact Set No. 65, Folder No. 7

Complaint: Unable to lock picture horizontally.

Cause: R89 (8.2K) in power supply chassis had opened, removing horizontal sync pulses from horizontal output back to horizontal sync discriminator.

Remedy: Replace R89.

John R. Crane
Crane Radio and Television Service
Excelsior, Minn.

EMERSON
MODEL 635 (Ch. 120108)

EMERSON
MODEL 635 (Ch. 120108)

EMERSON MODEL 635

TRADE NAME	Emerson, Model 635 (Ch. 120108)
MANUFACTURER	Emerson Radio and Phonograph Corp., 111 8th Ave., New York 11, New York
TYPE SET	AC Operated Combination Phono-Radio, Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 12BE6 Converter, 12BA6 IF Amp., 12AT6 DET-AVC-AF, 50B5 Power Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC — RATING .25 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT SEE CRESCENT MODEL M6A PHOTOFACT SET # 89, FOLDER # 4.

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set the pointer to the indentation mark near the left hand edge of the dial backplate.

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 12BE6 (V1). Low side to chassis.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output.	"	A6	"

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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PARTS LIST AND DESCRIPTIONS

EMERSON MODEL 635

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	800525	12BE6	7CH	
V2	IF Amp.	800524	12BA6	7BK	
V3	DET. -AVC-AF	800523	12AT6	7BT	
V4	Power Output	800527	50B5	7BZ	
V5	Rectifier	800526	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	150	925163	PRSA150/50-50		TA-505	Filter-Red
B	50	150					Filter-Green
C2	.1	200	920040	P288-1		TM-1	AVC Filter
C3	.05	400	920030	P488-05		72P51	Line Isolation
C4	.05	400	923105	P488-05		TM-15	Phono Isolation
C5A	220		470310	GP220M	GP2K-220		Diode RF Filter
B	2000			GP2000M	GP2M-002	34C3	Audio Coupling
C	220			GP220M	GP2K-220		AF Amp. Plate Bypass
D	5000			GP5000M	81Ĵ-005		Audio Coupling
C6	.001	600	923109	P688-001	GP2L-001	TM-21	Output Plate Bypass
C7	.05	400	920030	P488-05		TM-15	Tone Compensation
C8	.05	400	920030	P488-05		TM-15	Line Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	Switch		510069			Phono-Radio Switch
B	500KΩ	½				Volume control and on-off switch

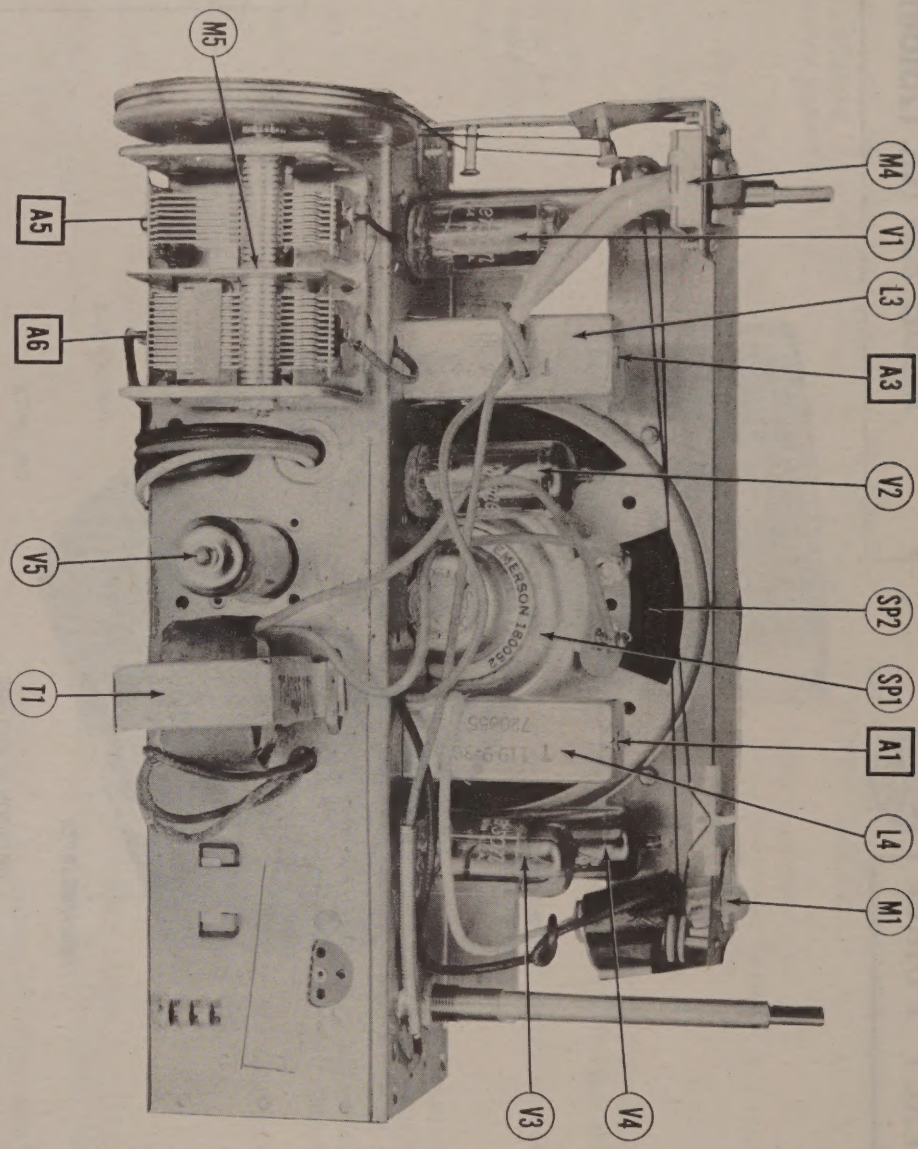
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R2	15 Meg.	½	351490	BTS-15 Meg.	AVC Network
R3	22KΩ	½	340810	BTS-22K	Osc. Grid
R4	120Ω	½	340270	BW-½-120	IF Cathode
R5	3.3 Meg.	½	351330	BTS-3.3 Meg.	AVC Network
R6	15 Meg.	½	351490	BTS-15 Meg.	AF Amp. Grid
R7	470KΩ	½	351130	BTS-470K	AF Amp. Plate
R8	470KΩ	½	351130	BTS-470K	Output Grid
R9	150Ω	½	340290	BW-½-150	Output Cathode
R10	1000Ω	1	370490	BW-1-1000	Filter
R11	39Ω	1	370150		Rect. Ballast

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T1	2.2KΩ	3.9Ω	155Ω Tap @ 4.8Ω	.5Ω	734055	A-3330 *	A-3031 *	RO-3 *	* Drill new mounting holes.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA EMERSON PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.				
SP1	PM	3.9Ω	180052			
	CONE DIA.	V. C. DIA.				
SP2	4 3/4"	9/16"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA EMERSON PART No.	MEISSNER PART No.
L1	Loop Ant.	3.8Ω			
L2	Osc. Coil	1Ω	10.5Ω	716044	14-1073
L3	1st IF	21Ω	21Ω	720055	16-6678
L4	2nd IF	21Ω	21Ω	720055	16-6678

DIAL LIGHTS

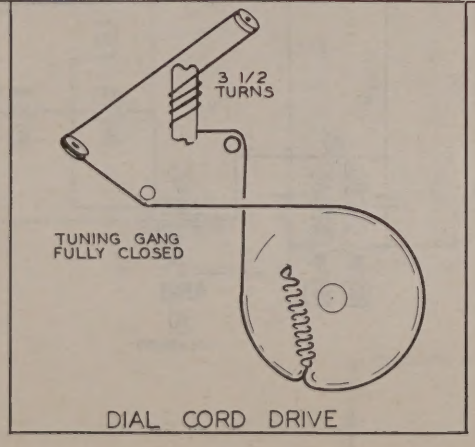
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA EMERSON PART No.		NOTES
M1	Bayonet	6-8	.15	Brown	807000		Type #47

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA EMERSON PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	REMARKS
M2		GCJ	G			

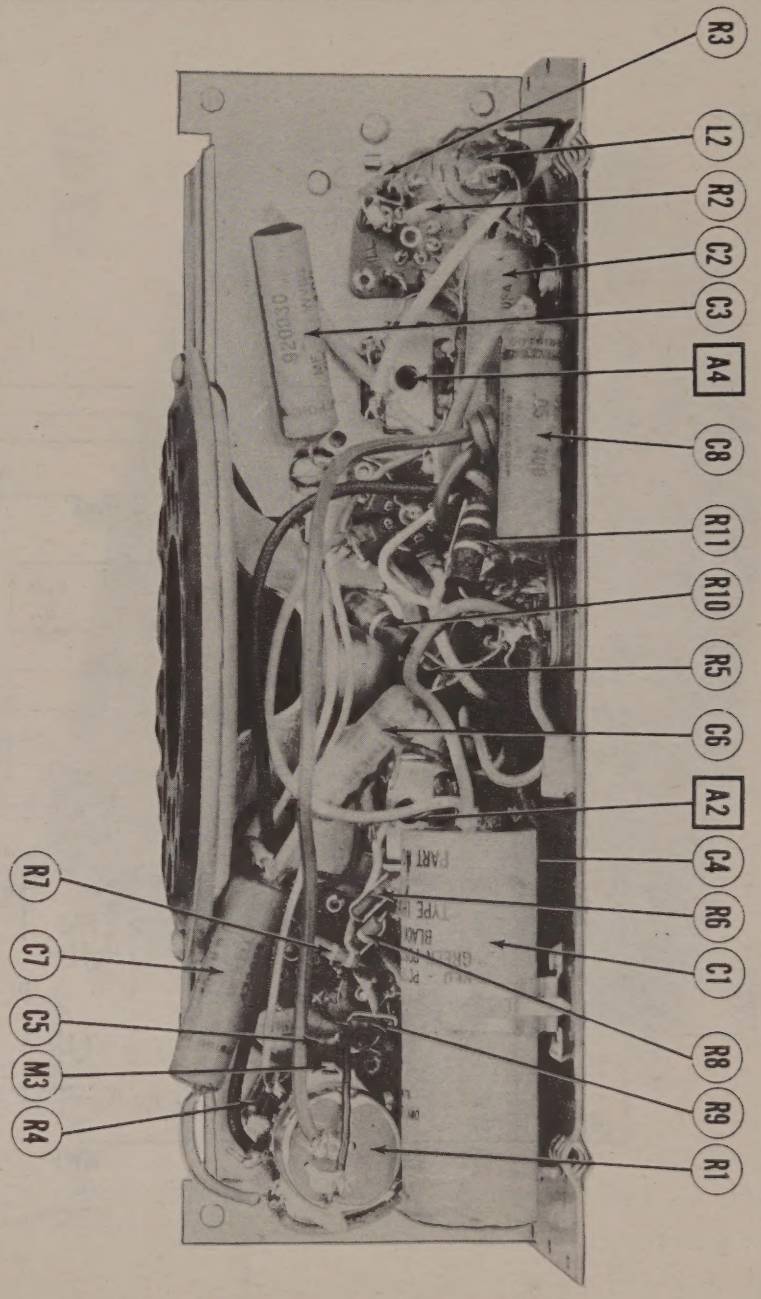
MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3	Switch	Part of R1	Radio-Phono
M4	Switch	510068	Tone
M5	2 Gang Var. Cap.	900066	(21-407MMF, 31-187MMF)
	Cabinet	140294	
	Dial Crystal	520115	
	Knob	450041S	Tuning
	Knob	450064	Tone
	Knob	450063	Radio-Phono



DIAL CORD DRIVE

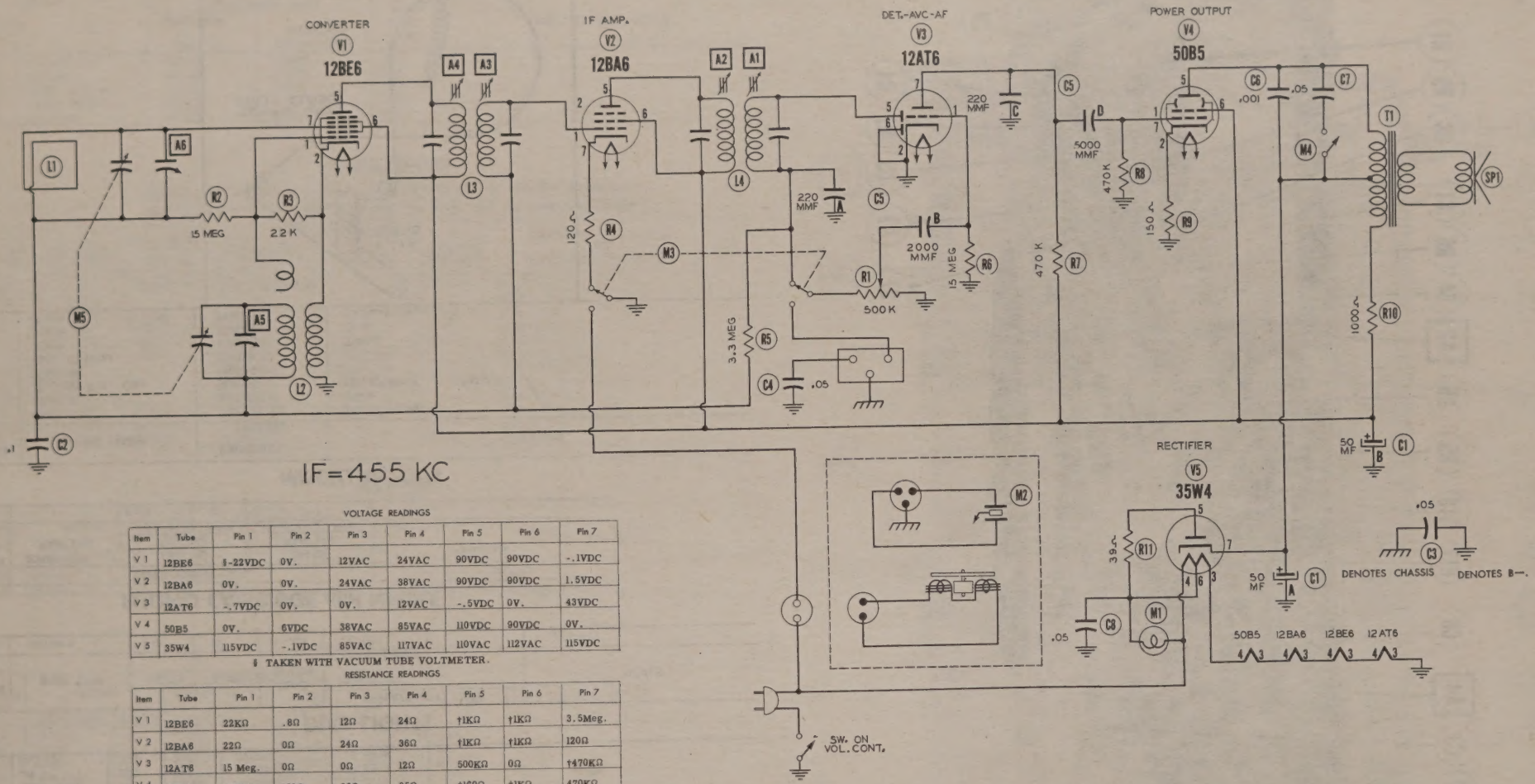
CHASSIS—BOTTOM VIEW



SET 92 FOLDER 1

EMERSON MODEL 635

EMERSON MODEL 635



IF=455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	§-22VDC	0V.	12VAC	24VAC	90VDC	90VDC	-.1VDC
V 2	12BA6	0V.	0V.	24VAC	38VAC	90VDC	90VDC	1.5VDC
V 3	12AT6	-.7VDC	0V.	0V.	12VAC	-.5VDC	0V.	43VDC
V 4	50B5	0V.	6VDC	36VAC	85VAC	110VDC	90VDC	0V.
V 5	35W4	115VDC	-.1VDC	85VAC	117VAC	110VAC	112VAC	115VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.8Ω	12Ω	24Ω	†1KΩ	†1KΩ	3.5Meg.
V 2	12BA6	22Ω	0Ω	24Ω	36Ω	†1KΩ	†1KΩ	120Ω
V 3	12AT6	15 Meg.	0Ω	0Ω	12Ω	500KΩ	0Ω	†470KΩ
V 4	50B5	470KΩ	150Ω	36Ω	85Ω	†160Ω	†1KΩ	470KΩ
V 5	35W4	150KΩ	3.5 Meg.	85Ω	110Ω	150Ω	110Ω	150KΩ

† MEASURED FROM PIN 7 OF V5.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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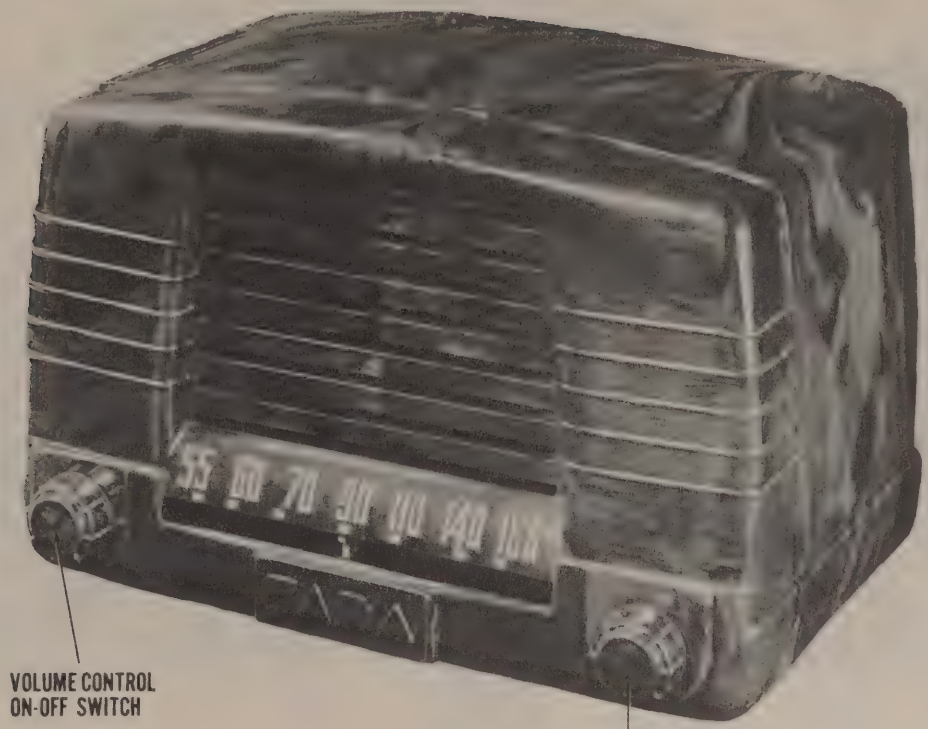
92-1

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

FADA
MODEL 855



FADA
MODEL 855

FADA MODEL 855

TRADE NAME	Fada, Model 855
MANUFACTURER	Fada Radio and Electric Co., Inc., 525 Main St., Belleville, New Jersey
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES(FIVE)	Types 12BE6 Converter, 12BA6 IF Amp., 12AT6 DET-AVC-AF, 50B5 Power Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC — RATING .24 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	530-1680KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer turn tuning gang fully closed and set the pointer even with the left hand vertical edge of the backplate cutout.

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and chassis.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on rear section of tuning gang. Low side to chassis.	456KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1680KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1500KC	Tune for max. output	"	A6	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		FADA PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	DET.-AVC-AF	12AT6	12AT6	7BT	
V4	Power Output	50B5	50B5	7BZ	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	FADA PART No.	AEROVOX PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	30	150	22.45	PRSA150/30-30		TA-330	Filter-Blue
B	30	150					Filter-Red
C2	.05	200	12.11	P288-05		TM-15	AVC Filter
C3	220		17.22	GP220M	GP2K-220	1FM-325	Diode RF Filter
C4	.005	400	12.19	P688-005	811-005	TM-25	Audio Coupling
C5	220		17.22	GP220M	GP2K-220	1FM-325	AF Amp. Plate Bypass
C6	.01	400	12.6	P488-01	821-01	TM-11	Audio Coupling
C7	.03	400	12.9	P488-03		TM-13	Output Plate Bypass
C8	.05	400	12.12	P488-05		TM-15	Line Filter

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	FADA PART No.	IRC PART No.	CLAROSTAT PART No.	
R1A	1 Meg.	½	52.32	Q13-137	M-63-Z	Volume control
B	Switch			76-1	SW-A	Attach to R1A per instructions

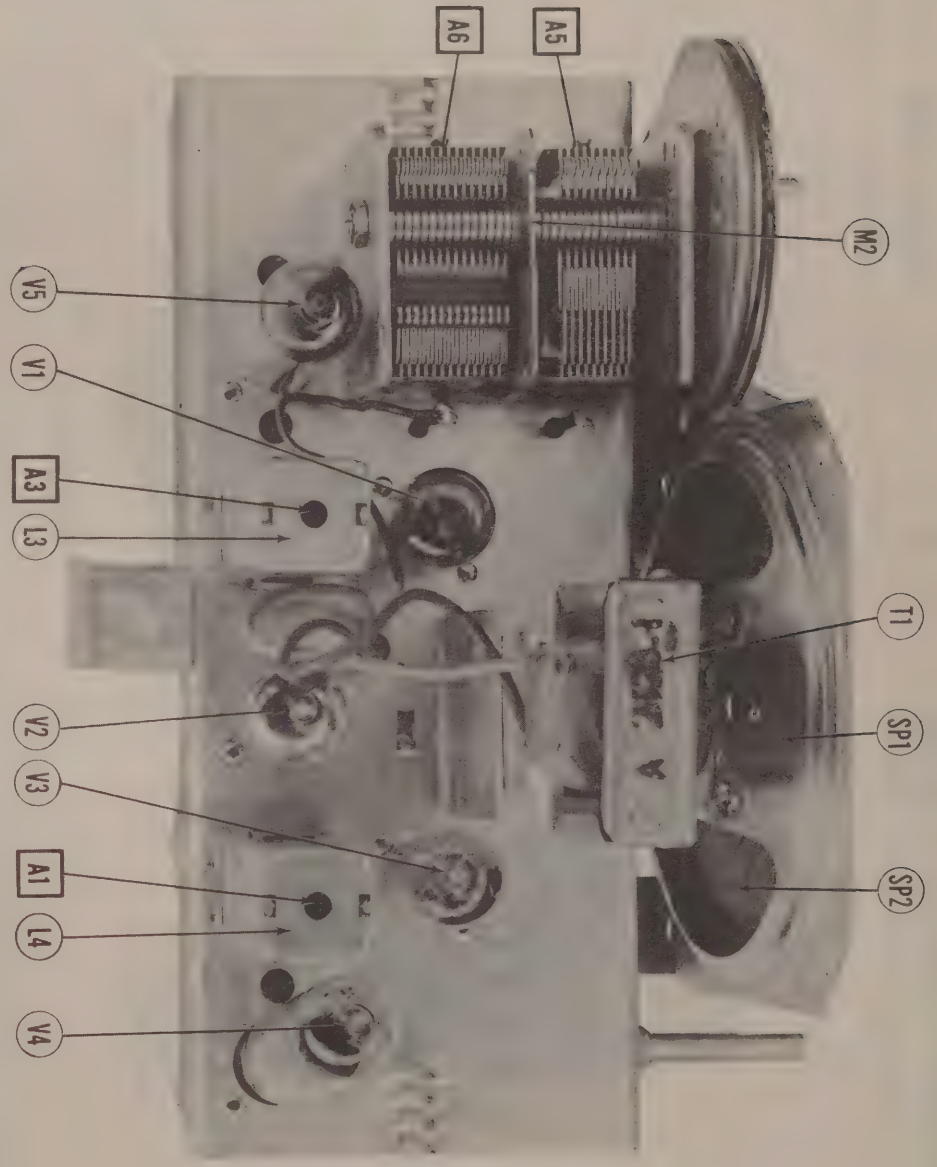
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	FADA PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	Osc. Grid
R3	100Ω	½	32.2	BW-½-100	IF Cathode
R4	1 Meg.	½	32.33	BTS-1 Meg.	AVC Network
R5	4.7 Meg.	½	32.98	BTS-4.7 Meg.	AF Grid
R6	220KΩ	½	32.91	BTS-220K	AF Plate
R7	470KΩ	½	32.92	BTS-470K	Output Grid
R8	150Ω	½	32.4	BW-½-150	Output Cathode
R9	1500Ω	1	32.47	BW-1-1500	Filter
R10	22Ω	2	32.123		Line Dropping-Wire Wound

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		FADA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.4KΩ	3.4Ω	168Ω	.5Ω		A-3876 ¶	A-2928 ¶	RO-2 ¶	¶ Bend mounting tabs down, file slots and remount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA FADA PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-113		* Remount output transformer.
SP1	PM	3.4Ω	107.35	MOD. P4-X	4A07 * ■	■ Use universal mounting bracket provided.
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

R F COILS

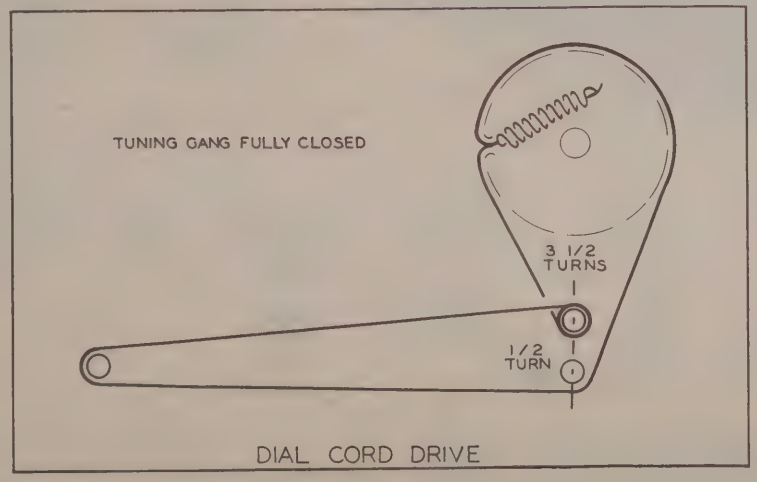
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA FADA PART No.	MEISSNER PART No.
L1	Loop Ant.	.1Ω	3.2Ω	37.146	
L2	Osc. Coil	0Ω	6Ω	37.153	14-1073
L3	1st IF	28Ω	29Ω	37.80	16-6678
L4	2nd IF	28Ω	29Ω	37.80	16-6678

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA FADA PART No.		NOTES
M1	Bayonet	6-8	.15	Brown	122.1		Type #47

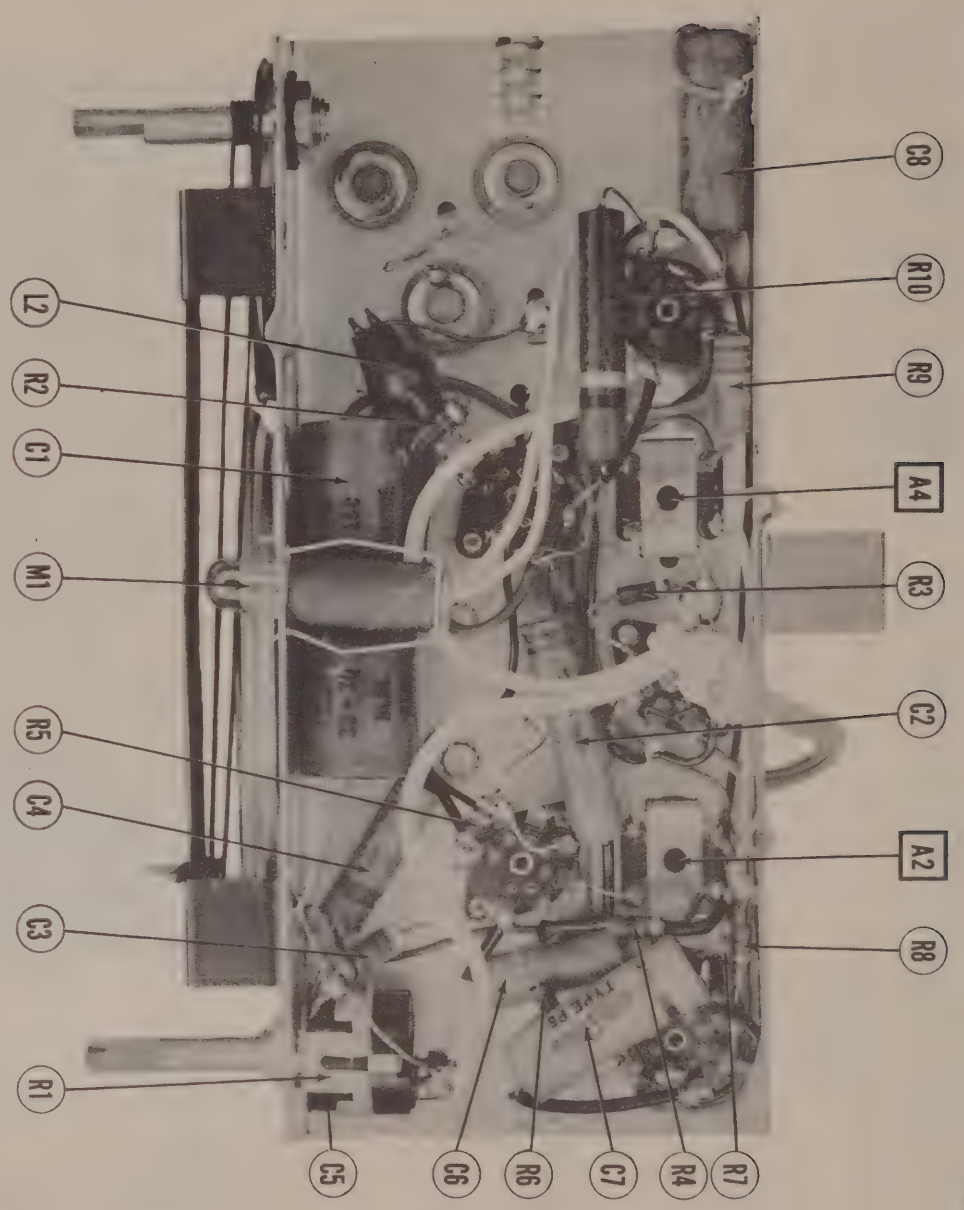
MISCELLANEOUS

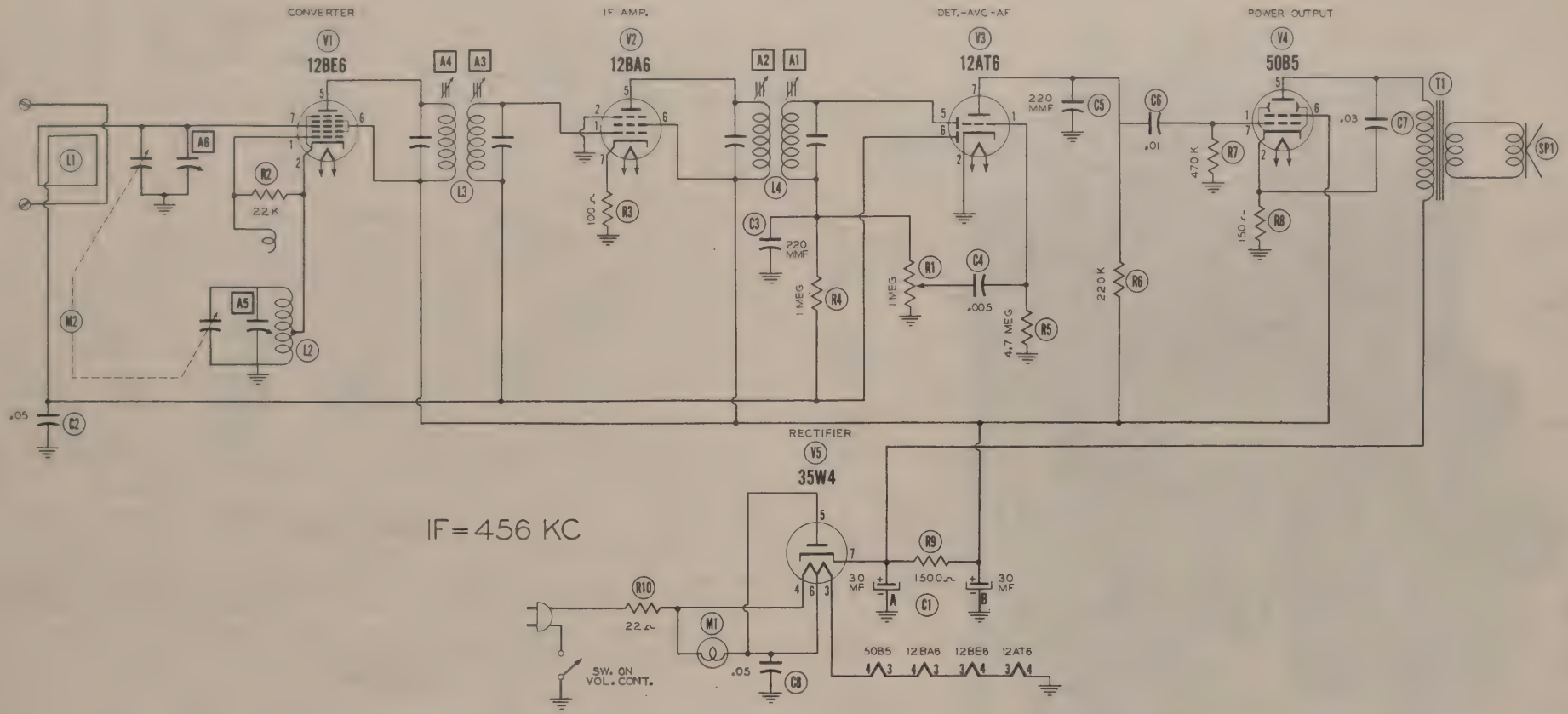
ITEM No.	PART NAME	FADA PART No.	NOTES
M2	2 Gang Var. Cap.	27.43	(35-444MMF, 37-212MMF)
	Dial Pointer	77.151	
	Cabinet	97-184W	Walnut
	Cabinet	97-184V	Ivory
	Cabinet	97-184M	Maroon
	Knob	142-25W	Walnut
	Knob	142-25V	Ivory
	Knob	142-25M	Maroon



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	§-28VDC	0V.	24VAC	12VAC	85VDC	85VDC	-.5VDC
V 2	12BA6	-.5VDC	0V.	24VAC	36VAC	85VDC	85VDC	.9VDC
V 3	12AT6	-.7VDC	0V.	12VAC	0V.	-.5VDC	-.5VDC	45VDC
V 4	50B5	.1VDC	5.5VDC	36VAC	85VDC	110VDC	85VDC	.1VDC
V 5	35W4	117VAC	0V.	85VAC	112VAC	108VAC	108VAC	117VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.5Ω	24Ω	12Ω	†1.5KΩ	1.5KΩ	2 Meg.
V 2	12BA6	2 Meg.	0Ω	24Ω	36Ω	†1.5KΩ	1.5KΩ	100Ω
V 3	12AT6	4.7 Meg.	0Ω	12Ω	0Ω	1 Meg.	2 Meg.	†220KΩ
V 4	50B5	470KΩ	150Ω	36Ω	85Ω	†160Ω	†1.5KΩ	470KΩ
V 5	35W4	130Ω	Inf.	85Ω	110Ω	110Ω	110Ω	500KΩ

† MEASURED FROM PIN 7 OF V5.

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

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DATE 4-50 SET 92 FOLDER 3

HALLICRAFTERS MODELS 518, 519, 520, 521, 600, 601, 602, 603, 604

HALLICRAFTERS MODELS 518, 519, 520, 521, 600, 601, 602, 603, 604

HALLICRAFTERS MODEL 600

TRADE NAME	Hallicrafters Models 518, 519, 520, 521. 600, 601, 602, 603, 604
MANUFACTURER	The Hallicrafters Co., 4401 W. 5th Ave., Chicago, Illinois
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.35 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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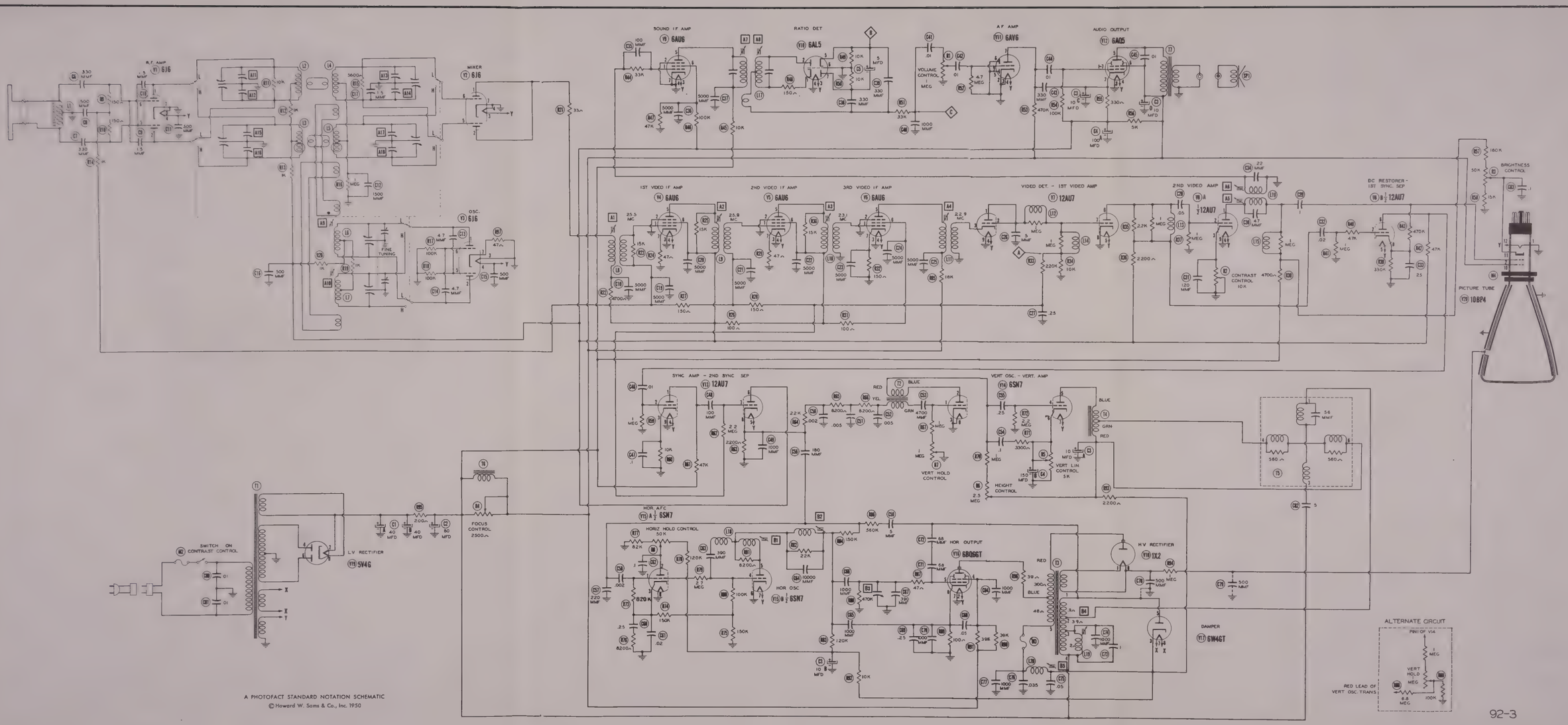
DATE 4-50 SET 92 FOLDER 3


R-F AMP
MIXER
OSC.
SOUND I-F AMP
RATIO DET
A-F AMP
AUDIO OUTPUT
1ST VIDEO I-F AMP
2ND VIDEO I-F AMP
3RD VIDEO I-F AMP
VIDEO DET. - 1ST VIDEO AMP
2ND VIDEO AMP
DC RESTORER - 1ST SYNC. SEP
SYNC AMP - 2ND SYNC SEP
VERT. OSC. - VERT. AMP
HOR. AFC
HOR. OSC
HOR. OUTPUT
H.V. RECTIFIER
DAMPER
L.V. RECTIFIER
SWITCH ON CONTRAST CONTROL
FOCUS CONTROL 2500Ω
VOLUME CONTROL 1 MEG
BRIGHTNESS CONTROL
CONTRAST CONTROL 10K
HORIZ. HOLD CONTROL 50K
VERT. HOLD CONTROL
VERT. LIN CONTROL 5K
HEIGHT CONTROL
FINE TUNING
PICTURE TUBE V20 10BP4
ALTERNATE CIRCUIT
PIN 1 OF V14
RED LEAD OF VERT. OSC. TRANS.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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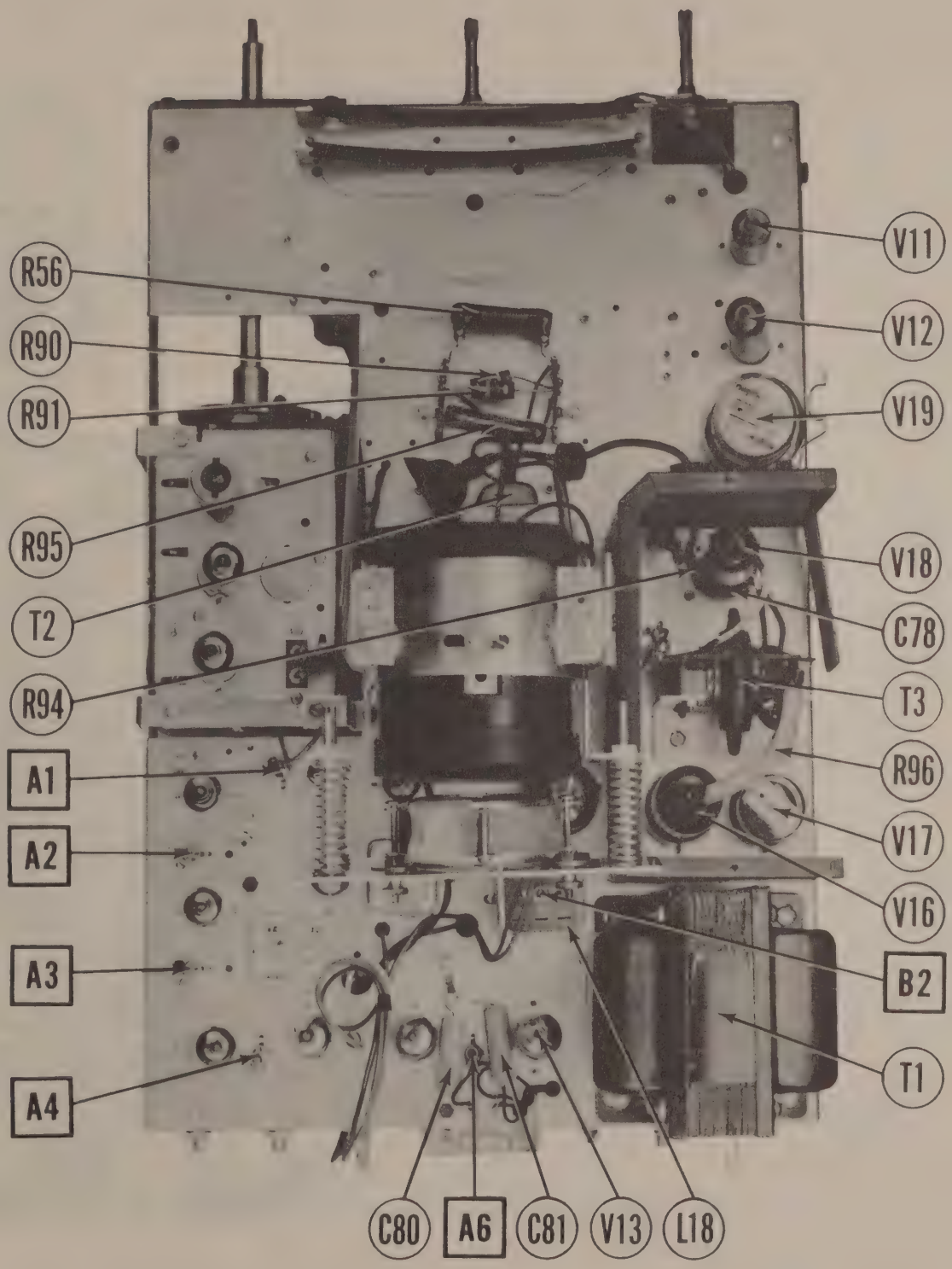
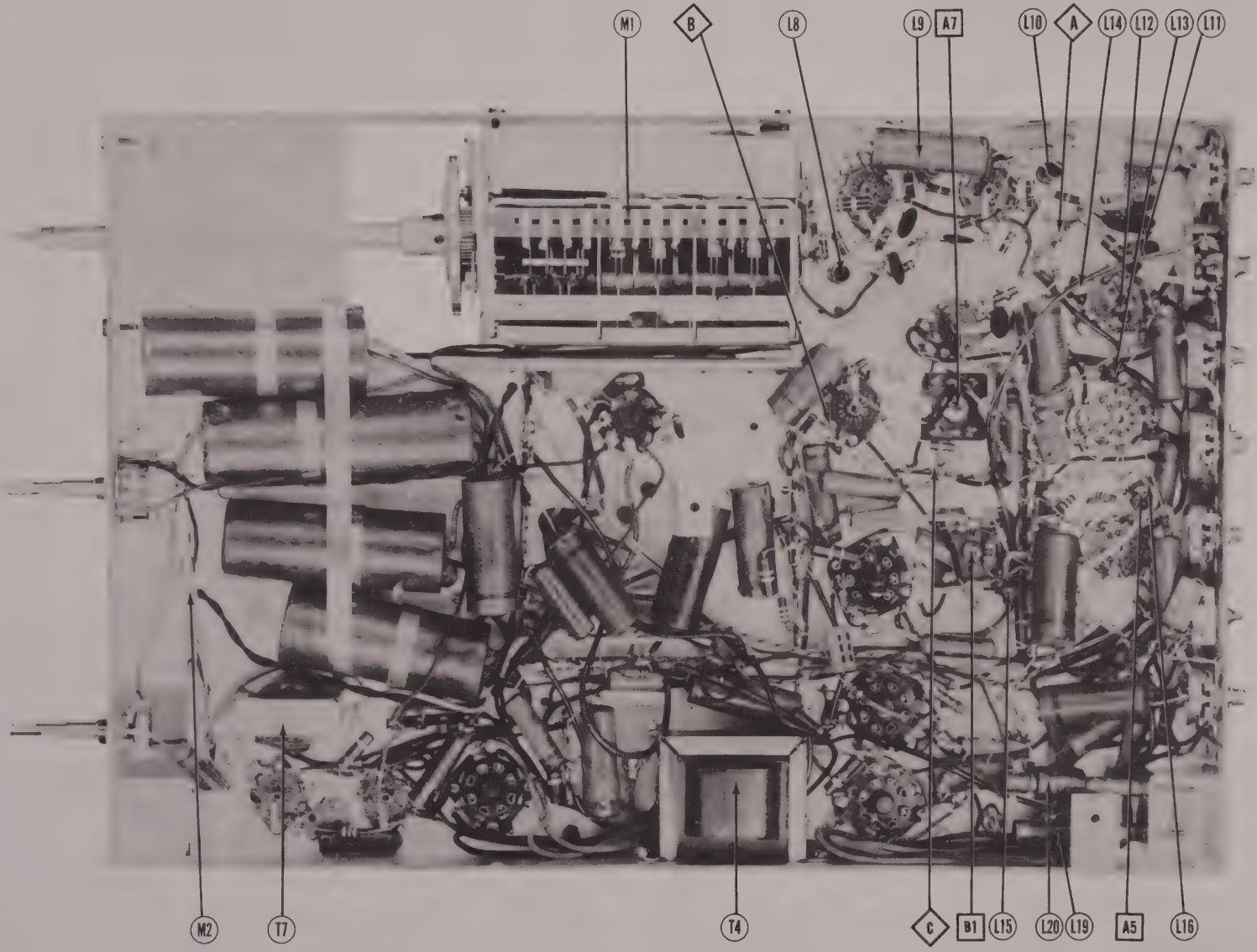
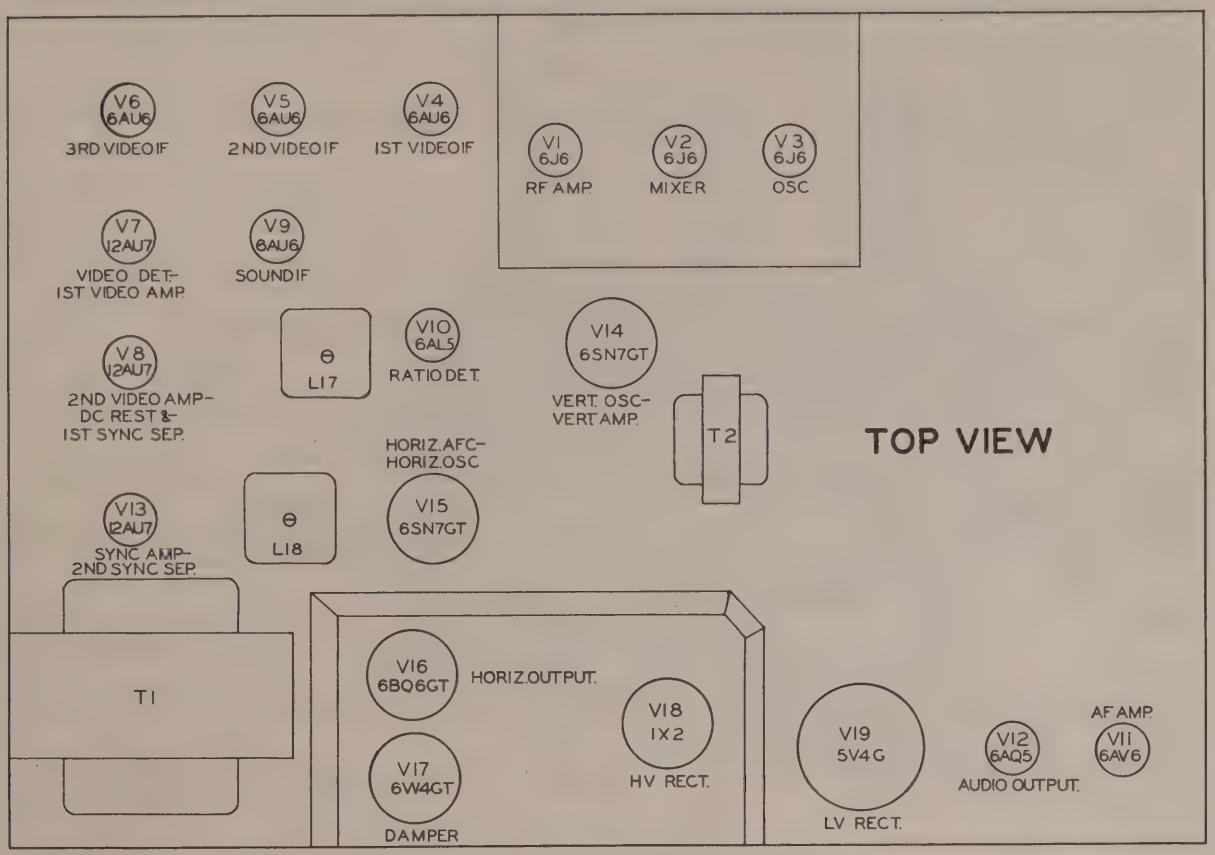
92-3

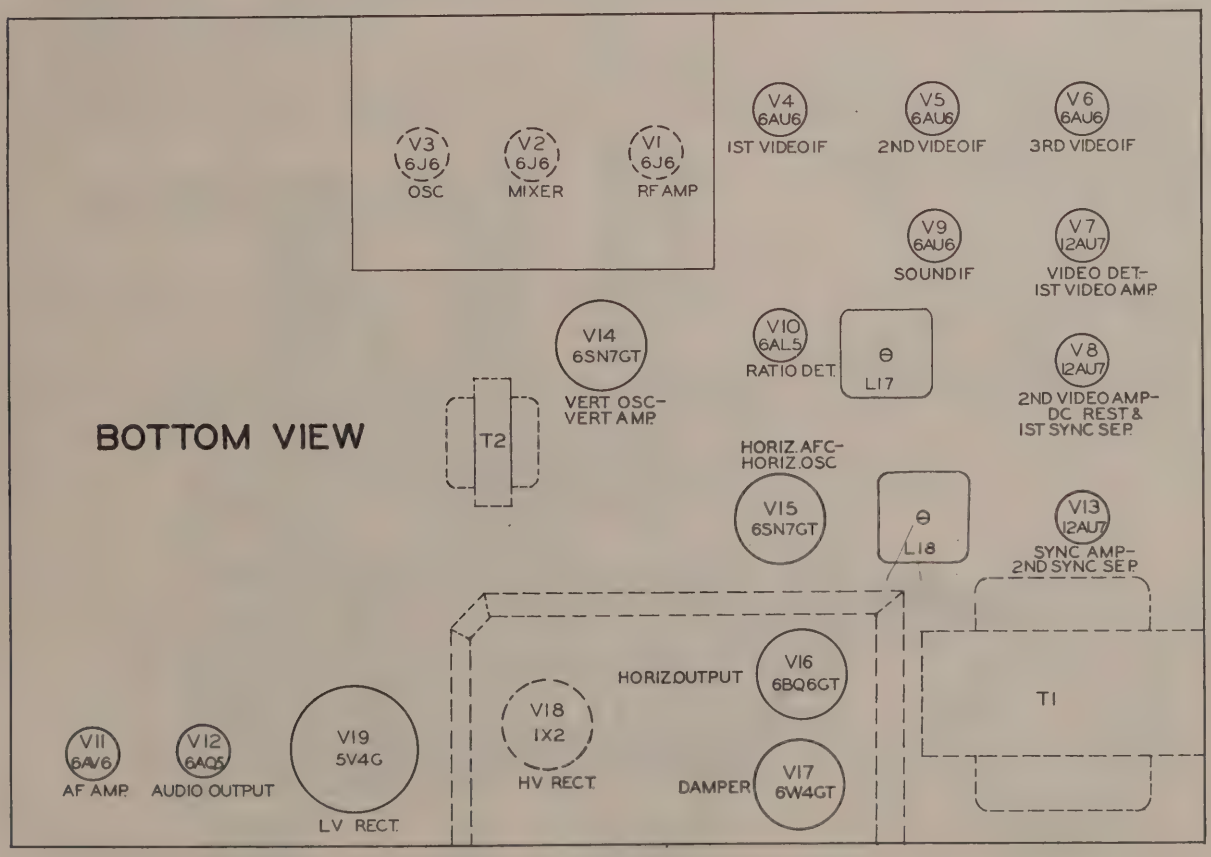


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard and remove the horizontal oscillator tube (V15) from its socket.

VIDEO IF ALIGNMENT

Remove the local oscillator (V3) to prevent erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	25.5MC (Unmod.)	Any	DC Probe to Point (A) Common to chassis.	A1	Adjust for maximum deflection.
2.	Direct	"	2 .9MC	"	"	A2	"
3.	Direct	"	23.1MC	"	"	A3	"
4.	Direct	"	22.9MC	"	"	A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	23MC (10MC SWP)	21.75MC 26.25MC	Any	Vert. Amp. to Point (A) Low side to chassis.		Check for response curve similar to Fig 1. If necessary retouch A1 thru A4 for optimum response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 2 (Grid) of 12AU7 (V8). Low side to chassis.	4.5MC (Unmod.)	Any channel not used locally	DC Probe to Point (B) Common to chassis.	A5, A6, A7	Adjust for maximum deflection. Attenuate signal generator to maintain 2 volt reading.
7.	.01MFD	"	"	"	DC Probe to Point (C) Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin 2 (Grid) of 12AU7 (V8). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any channel not used locally	Vert. Amp. to Point (B) Low side to chassis.	A5, A6, A7	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry as per Fig 2.
7.	.01MFD	"	"	"	"	Vert. Amp. to Point (C) Low side to chassis.	A8	Reconnect capacitor C5. Adjust A8 so 4.5MC occurs at center of crossover lines as per Fig 3. Slightly retouch A7 for maximum amplitude and straightness of crossover lines

OSCILLATOR ALIGNMENT

The local oscillator operates 24.5MC below the center frequency of each channel, therefore is necessary to use a 24.5MC "BFO" generator to obtain a zero beat with the center frequency of the channel. Loosely couple the "BFO" generator to the video detector (V7). There are no oscillator adjustments for the individual channels. The oscillator is adjusted for the low channels on channel 2, and for the high channels on channel 7. Replace tube V3.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	BFO GEN. FREQUENCY	ADJUST	REMARKS
8.	Two 150Ω carbon res.	Across antenna terminals with 150Ω in each lead.	57MC (Unmod.)	2	24.5MC	A9	Connect a .01 capacitor between pin 2 (Grid) of the picture tube and pin 1 (Grid) of the first audio tube (V11). Adjust for rough audio beat note in the speaker.
9.	"	"	177MC	7	"	A10	"

RF ALIGNMENT

The RF and Mixer lines of this receiver are pre-set at the factory and are normally very stable. Alignment should not be attempted unless they are definitely known to be out of alignment.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Two 150Ω carbon res.	Across antenna terminals with 150Ω in each lead.	85MC (Unmod.)	6	DC Probe to Point (A) Common to chassis.	A11, A12, A13, A14	Adjust for maximum deflection. Keep trimmer pairs at approximately the same relative position.
11.	"	"	213MC (Unmod.)	13	"	A15, A16, A17, A18	"

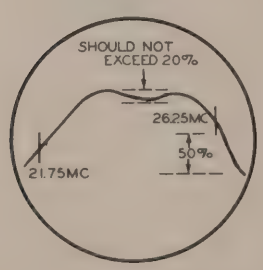


FIG.1

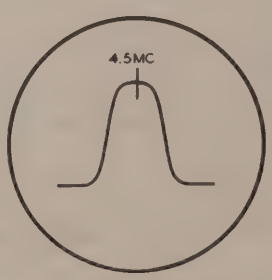


FIG. 2

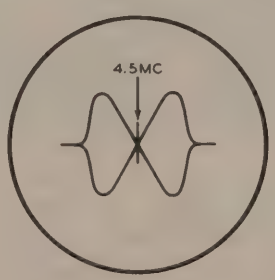
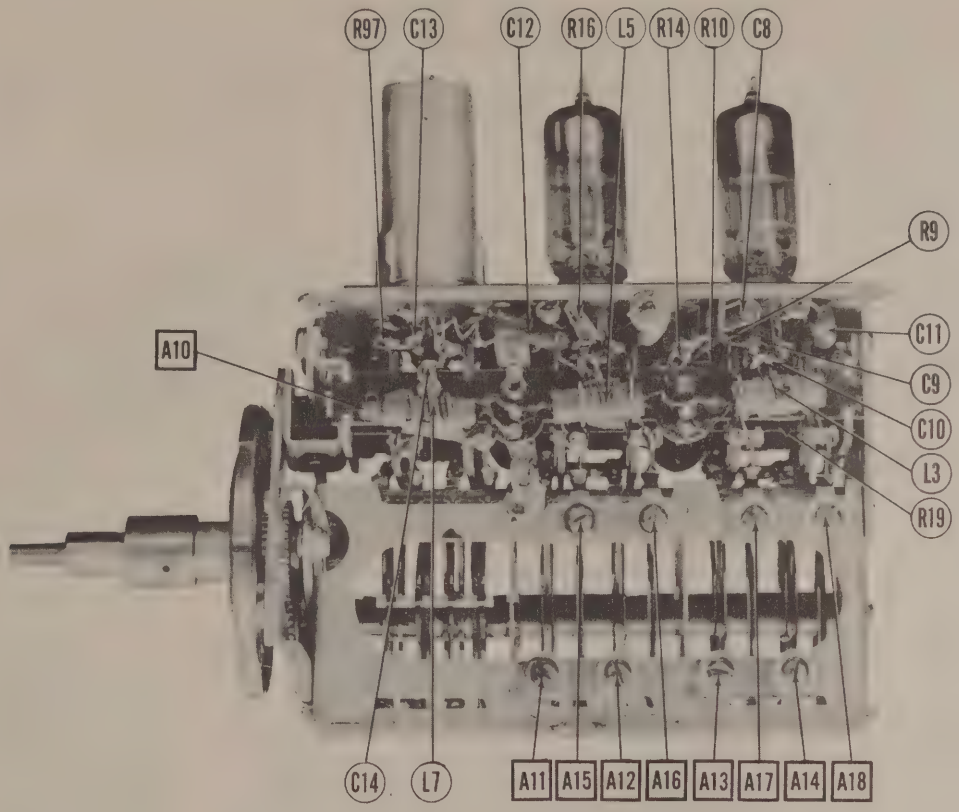
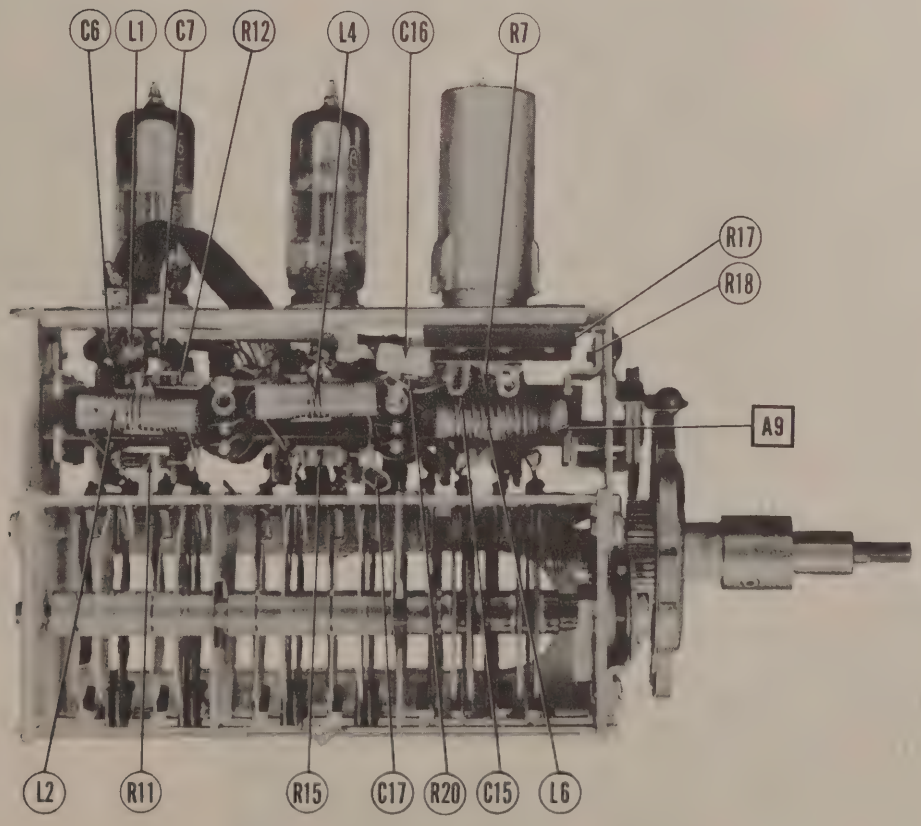


FIG. 3



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	95VDC	95VDC	0V.	6.3VAC	-.2VDC	-.3VDC	0V.		
V 2	6J6	95VDC	95VDC	6.3VAC	0V.	-2.4VDC	-2.6VDC	0V.		
V 3	6J6	100VDC	100VDC	0V.	6.3VAC	§-3.8VDC	§-4.2VDC	0V.		
V 4	6AU6	-2.6VDC	0V.	0V.	6.3VAC	122VDC	122VDC	.4VDC		
V 5	6AU6	-.6VDC	0V.	0V.	6.3 VAC	120VDC	120VDC	.4VDC		
V 6	6AU6	0V.	0V.	0V.	6.3VAC	235VDC	125VDC	1.1VDC		
V 7	12AU7	-.4VDC	-.4VDC	0V.	6.3VAC	6.3VAC	100VDC	-.4VDC	0V.	0V.
V 8	12AU7	310VDC	0V.	16VDC	6.3VAC	6.3VAC	120VDC	0V.	8.8VDC	0V.
V 9	6AU6	-.4VDC	0V.	6.3VAC	0V.	300VDC	33VDC	0V.		
V 10	6AL5	0V.	0V.	6.3VAC	0V.	.2VDC	0V.	-.2VDC		
V 11	6AV6	-.4VDC	0V.	0V.	6.3VAC	0V.	0V:	85VDC		
V 12	6AQ5	♦0V.	♦10VDC	0V.	6.3VAC	200VDC	210VDC	♦0V.		
V 13	12AU7	260VDC	0V.	12VDC	6.3VAC	6.3VAC	122VDC	0V.	4.5VDC	0V.
V 14	6SN7GT	-4.3VDC -4.7VDC	50VDC 15VDC	0V.	0V.	400VDC	0V. 20VDC	6.3VAC	0V.	
V 15	6SN7GT	-30VDC	120VDC 20VDC	-20VDC	-55VDC	175VDC	0V.	6.3VAC	0V.	
V 16	6BQ6GT	0V.	6.3VAC	410VDC	120VDC	-10VDC	320VDC	0V.	7.6VDC	TOP CAP *
V 17	6W4GT	380VDC	420VDC	420VDC	0V.	320VDC	200VDC	¶	¶	
V 18	1X2	* DO NOT MEASURE.								
V 19	5V4G	0V.	360VDC	0V.	325VAC	0V.	325VAC	0V.	360VDC	
V 20	10BP4	0V.	2.5VDC	PIN 10 120VDC	PIN 11 18VDC 80VDC	PIN 12 6.3VAC				

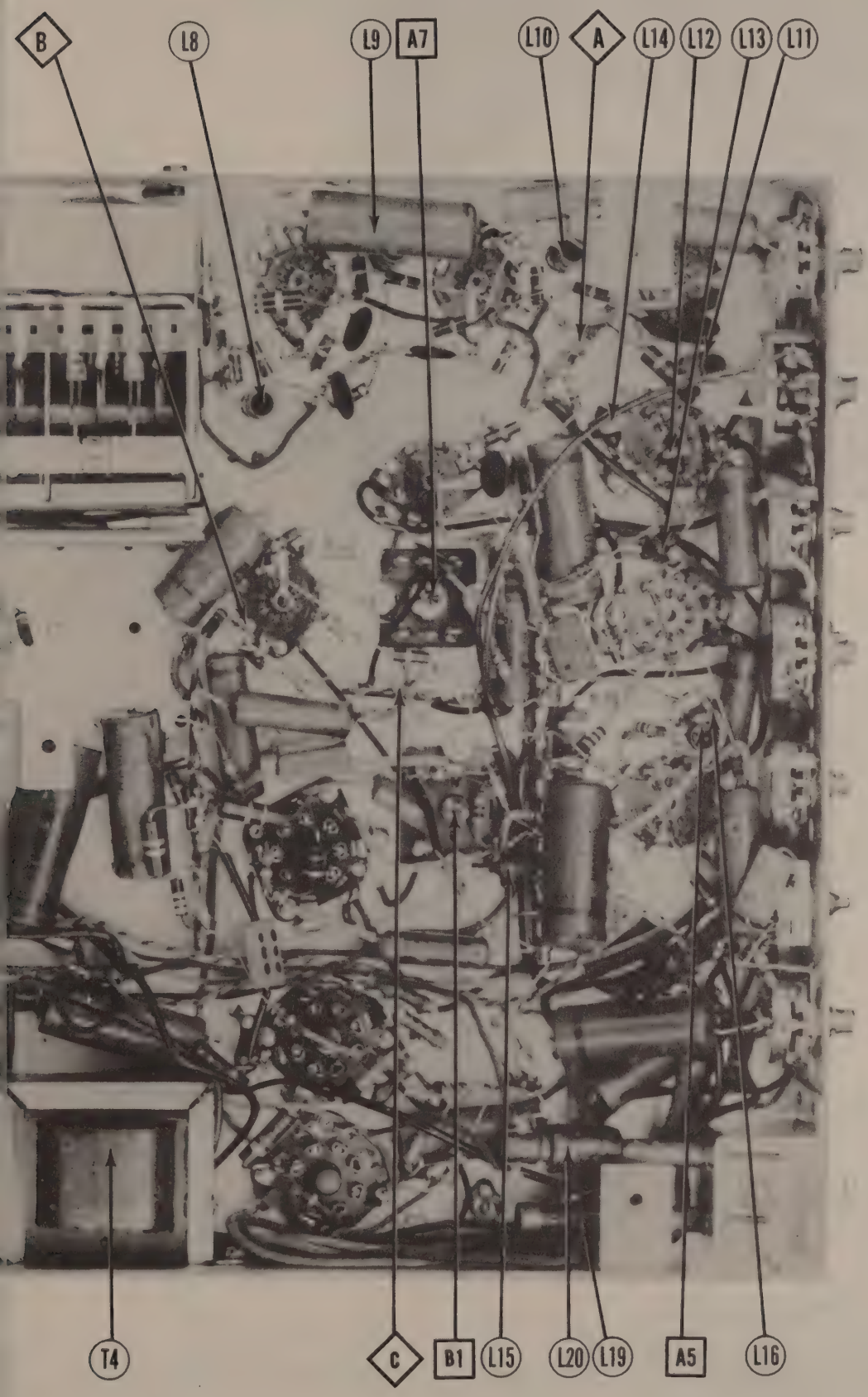
§ TAKEN WITH VACUUM TUBE VOLTMERTER.
* DO NOT MEASURE.
♦ MEASURED FROM PIN 6 OF V4.
¶ 6.3VAC MEASURED ACROSS FILAMENTS.

RESISTANCE READINGS

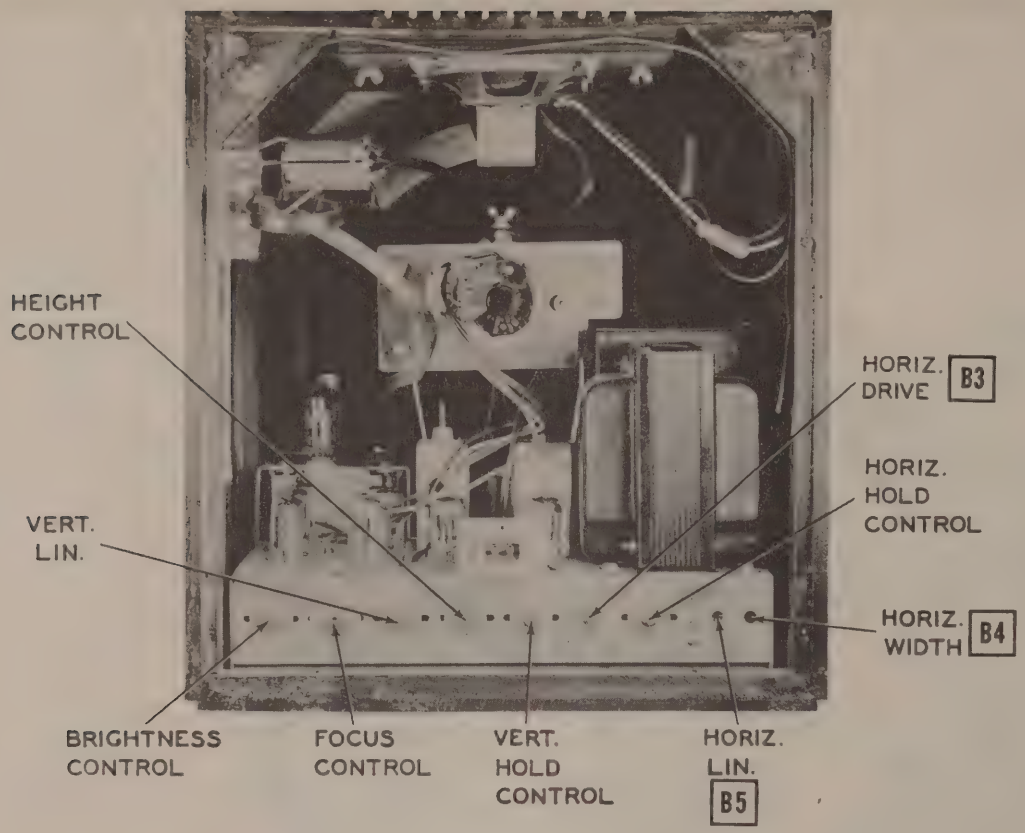
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	†6KΩ	†6KΩ	0Ω	.1Ω	230KΩ	230KΩ	0Ω		
V 2	6J6	†10KΩ	†10KΩ	.1Ω	0Ω	1 Meg.	1 Meg.	0Ω		
V 3	6J6	†6KΩ	†6KΩ	0Ω	.1Ω	100KΩ	100KΩ	47Ω		
V 4	6AU6	230KΩ	0Ω	0Ω	.1Ω	†5KΩ	†5KΩ	47Ω		
V 5	6AU6	230KΩ	0Ω	0Ω	.1Ω	†5KΩ	†5KΩ	47Ω		
V 6	6AU6	.2Ω	0Ω	0Ω	.1Ω	†18KΩ	†5KΩ	150Ω		
V 7	12AU7	10KΩ	10KΩ	.2Ω	.1Ω	.1Ω	†7.2KΩ	10KΩ	0Ω	0Ω
V 8	12AU7	†4KΩ	1 Meg.	10KΩ	.1Ω	.1Ω	†50KΩ	1 Meg.	330KΩ	0Ω
V 9	6AU6	33KΩ	0Ω	.1Ω	0Ω	†10KΩ	†50KΩ	0Ω		
V 10	6AL5	Inf.	Inf.	.1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 11	6AV6	4.7 Meg.	0Ω	0Ω	.1Ω	0Ω	0Ω	†470KΩ		
V 12	6AQ5	♦100KΩ	♦330Ω	0Ω	.1Ω	†800Ω	†450Ω	♦100KΩ		
V 13	12AU7	†47KΩ	1 Meg.	10KΩ	.1Ω	.1Ω	†5KΩ	2.3 Meg.	2.2KΩ	0Ω
V 14	6SN7GT	2.4 Meg. 1.1 Meg.	#3.5 Meg. #1 Meg.	0Ω	2.2Meg.	#2.8KΩ	5KΩ 5Ω	.1Ω	0Ω	
V 15	6SN7GT	1 Meg.	#150KΩ #120KΩ	300KΩ	250KΩ	#110KΩ	0Ω	.1Ω	0Ω	
V 16	6BQ6GT	Inf.	.1Ω	#38Ω	†19KΩ	470KΩ	†200Ω	0Ω	100Ω	TOP CAP #130Ω
V 17	6W4GT	140KΩ	150KΩ	180KΩ	Inf.	†200Ω	140KΩ	Inf.	Inf.	
V 18	1X2	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #410Ω
V 19	5V4G	Inf.	40KΩ	Inf.	45Ω	Inf.	41Ω	Inf.	40KΩ	
V 20	10BP4	0Ω	800KΩ	PIN 10 †500Ω	PIN 11 42KΩ 15KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 8 OF V19.
# MEASURED FROM PIN 3 OF V17.
♦ MEASURED FROM PIN 6 OF V4.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



TOR AND ALIGNMENT IDENTIFICATION



CABINET-REAR VIEW

HORIZONTAL OSCILLATOR ADJUSTMENTS

Connect a short across terminals "C and D" of L18.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Remove the short and connect the vertical amplifier of an oscilloscope to terminal "D" of L18.

Adjust the waveform adjustment slug (B2) until the broad and sharp peaks are of equal amplitude as shown in figure 4. If necessary, readjust the hold control so picture remains in sync.

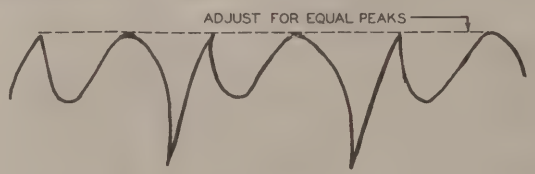


FIG. 4

HORIZONTAL LINEARITY ADJUSTMENTS

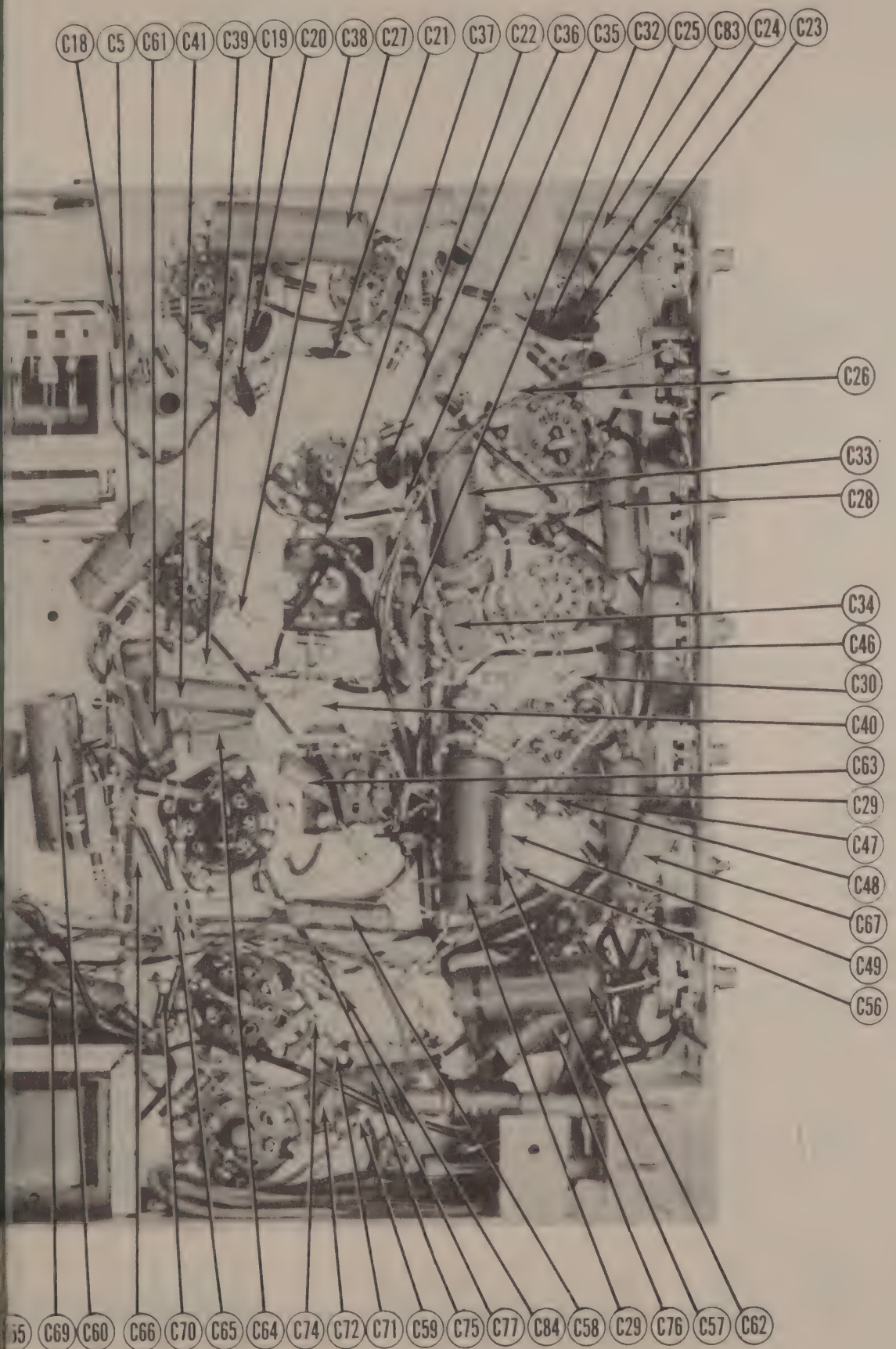
Turn the horizontal drive trimmer (B3) clockwise as far as possible without causing fold-over in the raster.

Adjust the width slug (B4) until the picture fills the mask horizontally.

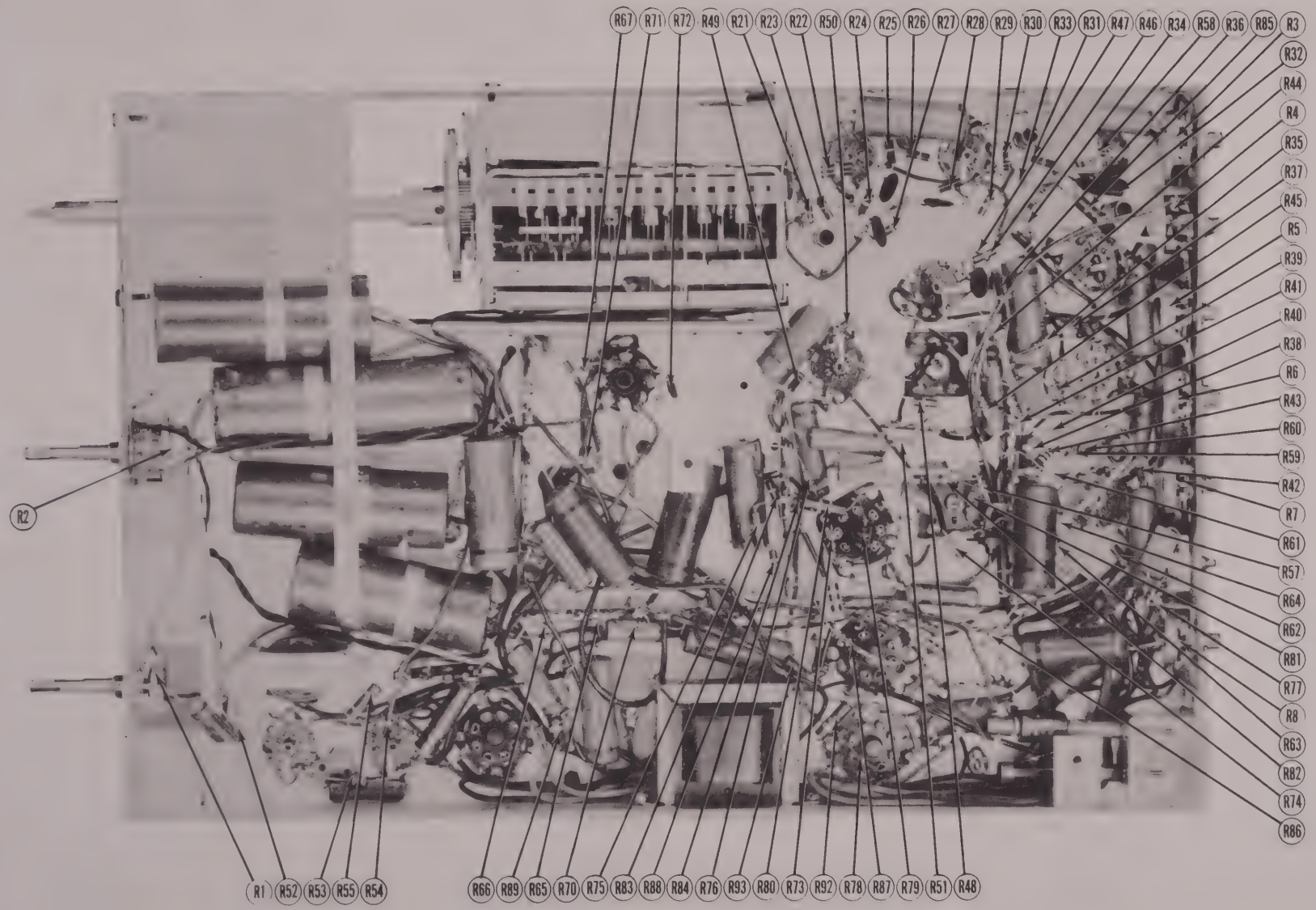
Adjust the horizontal linearity slug (B5) until the picture is symmetrical from left to right. Readjustment of B3 may be necessary while making this adjustment.

DISASSEMBLY INSTRUCTIONS

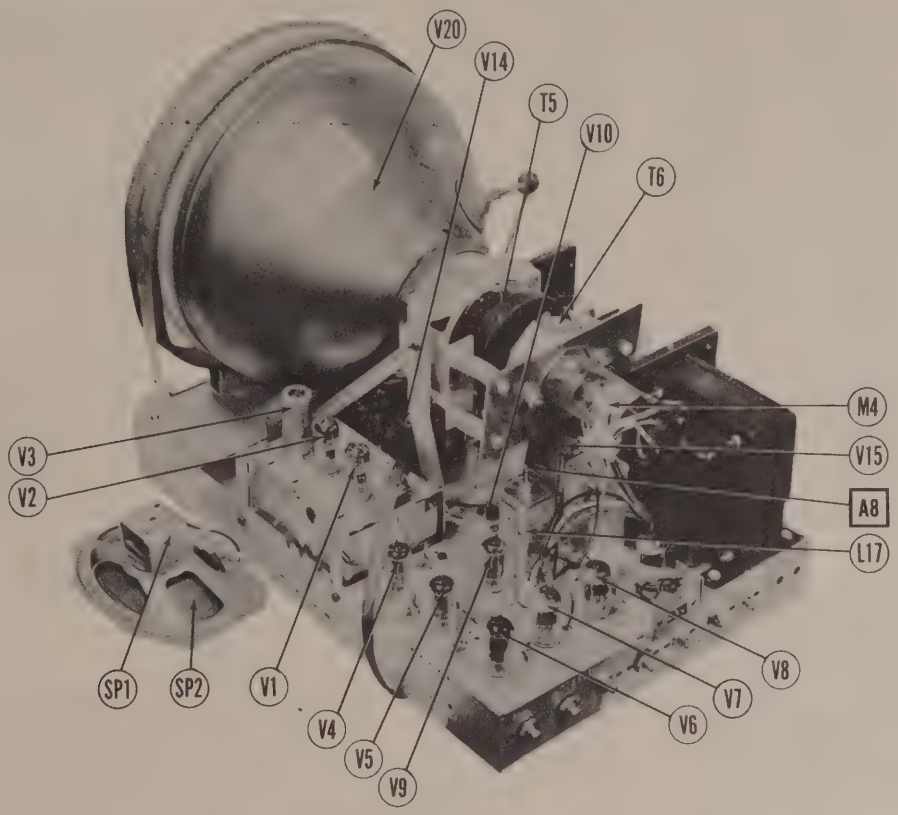
1. Remove three front and one side push-on type control knobs.
2. Remove seven phillips head screws and one 1/4" hex head bolt holding rear cover. Remove cover.
3. Disconnect speaker plug.
4. Remove two wing nuts holding speaker mounting board. Remove speaker on board.
5. Loosen antenna terminal screws and remove built-in antenna if used.
6. Remove two phillips head screws holding antenna terminal strip.
7. Remove one 1/2" hex nut holding antenna trimmer. Remove trimmer from mounting and push aside.
8. Remove five screws holding TV chassis. Remove chassis.



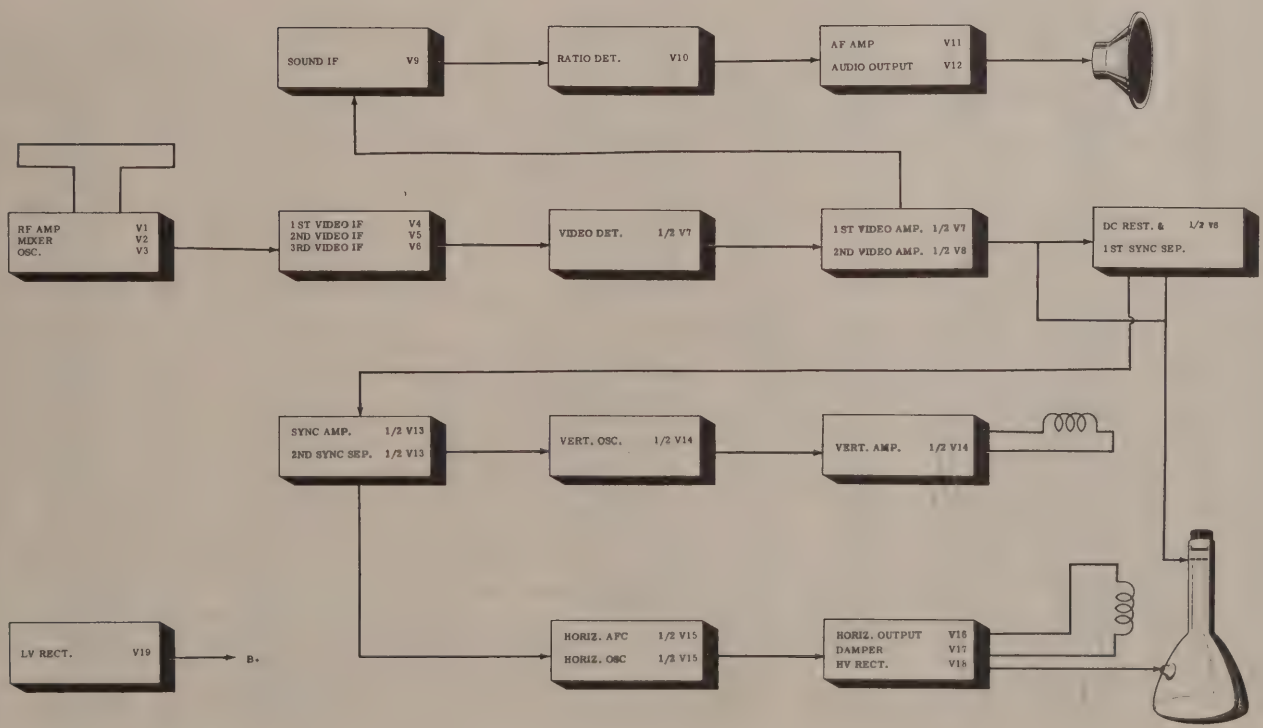
ACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS-TOP VIEW



BLOCK DIAGRAM

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA HALLICRAFTERS PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6J6	6J6	7BF	
V2	Mixer	6J6	6J6	7BF	
V3	Oscillator	6J6	6J6	7BF	
V4	1st Video IF	6AU6	6AU6	7BK	
V5	2nd Video IF	6AU6	6AU6	7BK	
V6	3rd Video IF	6AU6	6AU6	7BK	
V7	Video Det. -1st Video Amp.	12AU7	12AU7	9A	
V8	2nd Video Amp. - DC Restorer-1st Sync. Sep.	12AU7	12AU7	9A	
V9	Sound IF	6AU6	6AU6	7BK	
V10	Ratio Det.	6AL5	6AL5	6BT	
V11	AF Amp.	6AV6	6AV6	7BT	
V12	Audio Output	6AQ5	6AQ5	7BZ	
V13	Sync. Amp. -2nd Sync. Sep.	12AU7	12AU7	9A	
V14	Vert. Osc. -Vert. Amp.	6SN7GT	6SN7GT	8BD	
V15	Hor. AFC-Hor. Osc.	6SN7GT	6SN7GT	8BD	
V16	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1X2	1X2	7CB	
V19	LV Rectifier	5V4G	5V4G	5L	
V20A	Picture Tube	10BP4	10BP4	12D	Model 600
B	Picture Tube	12LP4	12LP4	12D	Models 518, 521, 601, 602
C	Picture Tube	16AP4	16AP4	12D	Models 519, 520, 603, 604

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA AEROVOX PART No.	REPLACEMENT DATA ERIE PART No.	REPLACEMENT DATA SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	45B137	PRSA450/40-40		TVL-64#	Filter-Red
B	40	450					Filter-Red
C2	80	450	45B158	PRSA450/40-40		TVL-9#	Filter
C3A	10	450	45B157	PRSA2222J		TVL-39#	Decoupling-Red
B	10	450					Decoupling-Red
C	10	450					Output Cathode Bypass-Blue
D	10	450					Decoupling-Yellow
C4A	100	250	45B156	PRSA20F30B			Decoupling-Red
B	150	50					Vert. Output Cathode Bypass-Yel.
C5	5	50	45A109	PRS150/4		TVA-13	Stabilizing Cap.
C6	330		47B20331K5	GP330M	GP2K-330		RF Coupling
C7	330		47B20331K5	GP330M	GP2K-330		RF Coupling
C8	1500		47B20152K5	GP1500M	GP2L-0015		AGC Filter
C9	1.5		47A160-3	C11.5CNPO	NPOK-1.5		Neutralizing
C10	1.5		47A160-3	C11.5CNPO	NPOK-1.5		Neutralizing
C11	500		47B20501K5	GP500M	GP2K-500		RF Filament Bypass
C12	1500		47B20152K5	GP1500M	GP2L-0015		Mixer Grid Filter
C13	4.7		47A160-6	CN4.7DN750	N750K-5		Osc. Feedback
C14	4.7		47A160-6	CN4.7DN750	N750K-5		Osc. Feedback
C15	500		47B20501K5	GP500M	GP2K-500		Osc. Filament Bypass
C16	500		47B20501K5	GP500M	GP2K-500		RF Bypass
C17	1.5		47A160-3	C11.5CNPO	NPOK-1.5		Fixed Trimmer
C18	5000		47A168	BPD-5	811-005	29C1	Mixer Plate Decoupling
C19	5000		47A168	BPD-5	811-005	29C1	AGC Filter
C20	5000		47A168	BPD-5	811-005	29C1	1st V. IF Decoupling
C21	5000		47A168	BPD-5	811-005	29C1	AGC Filter
C22	5000		47A168	BPD-5	811-005	29C1	2nd V. IF Decoupling
C23	5000		47A168	BPD-5	811-005	29C1	3rd V. IF Cathode Bypass
C24	5000		47A168	BPD-5	811-005	29C1	3rd V. IF Decoupling
C25	5000		47A168	BPD-5	811-005	29C1	3rd V. IF Plate Decoupling
C26	5		47B20050K5		NPOK-5	MS-55	V. Diode Filter
C27	.25	200	46AT254J	P488-25		TC-2	AGC Filter
C28	.05	200	46AY503J	P288-05		TM-15	Video Coupling
C29	.1	600	46AU104J	P688-1		TM-1	Video Coupling
C30	47			CN47JNPO	NPOM-50	MS-45	Fixed Trimmer
C31	120	500	47X20A121M	1468-00015	GP2K-120	1FM-315	2nd V. Amp. Cathode Bypass
C32	.02	400	46AY203J	P488-02		TM-12	Video Coupling
C33	.25	200	46AT254J	P488-25		TC-2	DC Res. Cathode Bypass
C34	22	500	47X20A220K	1469-000025	GP1K-22	MS-425	Fixed Trimmer
C35	100		47X20A101M	GP100M	GP1K-100	1FM-31	S. IF Coupling
C36	5000		47A168	BPD-5	811-005	29C1	S. IF Screen Bypass
C37	5000		47A168	BPD-5	811-005	29C1	S. IF Plate Decoupling
C38	330		47B20331K5	GP330M	GP2K-330	1FM-335	Diode Load Cap. *
C39	330		47B20331K5	GP330M	GP2K-330	1FM-335	Diode Load Cap. *
C40	1000		47B20102M5	GP1000M	GP2L-001	1FM-21	De-emphasis
C41	.01	200	46AU502J	P488-01	821-01	TM-11	Audio Coupling †
C42	.01	400	46AU103J	P488-01	821-01	TM-11	Audio Coupling
C43	330	500	47X20A331M	1468-00035	GP2K-330	1FM-335	AF Amp. Plate Bypass
C44	.01	600	46AY103J	P688-01	821-01	TM-11	Audio Coupling
C45	.01	600	46AY103J	P688-01	821-01	TM-11	Output Plate Bypass
C46	.01	200	46AU103J	P488-01	821-01	TM-11	Sync. Coupling
C47	.1	200	46AU104J	P288-1		TM-1	2nd Sync. Amp. Cathode Bypass
C48	100		47X20A101M	GP100M	GP1K-100	1FM-31	Sync. Coupling
C49	1000	500	47X20A102M	1468-001	GP2L-001	1FM-21	2nd Sync. Sep. Cathode Bypass
C50	.002	600	46AZ202J	P688-002	GP2M-002	TM-22	Integrator Net.
C51	.005	200	46AU502J	P688-005	811-005	TM-25	Integrator Net.
C52	.005	200	46AU502J	P688-005	811-005	TM-25	Integrator Net.
C53	4700	500	47X35A472M	1467-005	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C54	.1	600	46AU104J	P688-1		TM-1	Vert. Discharge
C55	.25	600	46AX254J	684-25		TC-2	Vert. Sweep Coupling
C56	180	500	47X20A181M	1468-0002	GP2K-180	1FM-32	Hor. Sync. Coupling
C57	220	500	4720A221M	1468-00025	GP2K-220	1FM-325	Voltage Divider

CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA AEROVOX PART No.	REPLACEMENT D ER PART
C58	.002	600	46AZ202J	P688-002	GP2M-
C59	5		47B20050K5	CI5DNPO	NPOK-
C60	.25	200	46AT254J	P488-25	
C61	.02	600	46AY203J	P688-02	
C62	.1	600	46AU104J	P688-1	
C63	390	500	47X20A391M	1468-0004	GP2K-
C64	10000	300	47X35A103K	1467-01	821-01
C65	1000	500	47X20A102M	1468-001	GP2L-
C66	1000	500	47X20A102M	1468-001	GP2L-
C67	390	500	47X20A391M	1468-0004	GP2K-
C68	.05	600	47AY503J	P688-05	
C69	.25	200	46AT254J	P488-25	
C70	1000		47B20102M5	GP1000M	GP2L-
C71	68			GP68M	GP1K-
C72	68			GP68M	GP1K-
C73	.1	200	46AU104J	P288-1	
C74	1000		47B20102M5	GP1000M	GP2L-
C75	.05	600	46AY503J	P688-05	
C76	.035	600	46AY353J	P688-033	
C77	1000		47B20102M5	GP1000M	GP2L-
C78	500	20000	47A216		
C79	500	20000	47A216		
C80	.01	600	46BR103L6	P688-01	821-01
C81	.01	600	46BR103L6	P688-01	821-01
C82	.5	200	46AT254J	P288-5	
C83	.1	200	46AU104J	P288-1	
C84	1000		47B20102M5	GP1000M	GP2L-

* When either item C38 or C39 are replaced, replace both w
† Some models use .05MFD in this application.
‡ Not used in all models.
§ Some models use .25MFD in this application.
# Use mounting strap.
♦ Parallel sections to obtain desired capacity.

CON

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA IRC PART No.	REPLACEMENT DATA CLARO PART
R1A	1 Meg.	1/2	25A856	Q13-137	AM-6
B	Shaft		Not Req.	Not Req.	KSS-3
R2	10KΩ	2	25B790		25B79
R3	50KΩ	1/2	25A858	Q11-123	M-44
R4	2500Ω	2	25B710	W-3000	43-30
R5	5000Ω	1/2	25B712	Q11-114	M-19
R6	2.5 Meg.	1/2	25B711	Q11-239	M-84
R7	1 Meg.	1/2	25A857	Q11-137	M-61
R8	50KΩ	1/2	25A858	Q11-123	M-44

RES

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA HALLICRAFTER PART No.	REPLACEMENT DATA IRC PART No.
R9	150Ω	1/2	23X20X151K	
R10	150Ω	1/2	23X20X151K	
R11	10KΩ	1/2	23X20X103K	BTS-10K
R12	1000Ω 20%	1/2	23X20X102K	BTS-1000
R13	1000Ω 20%	1/2	23X20X102K	BTS-1000
R14	1000Ω 20%	1/2	23X20X102K	BTS-1000
R15	5600Ω	1/2	23X20X562K	BTS-5600
R16	1 Meg. 20%	1/2	23X20X105K	BTS-1 Meg.
R17	100KΩ 20%	1/2	23X20X104K	BTS-100K
R18	100KΩ 20%	1/2	23X20X104K	BTS-100K
R19	1000Ω 20%	1/2	23X20X102K	BTS-1000
R20	1000Ω 20%	1/2	23X20X102K	BTS-1000
R21	33Ω	1/2	23X20X330K	
R22	4700Ω	1/2	23X30X472K	
R23	15KΩ	1/2	23X20X153K	
R24	47Ω	1/2	23X20X470K	
R25	15KΩ	1/2	23X20X153K	
R26	100Ω	1/2	23X20X101K	
R27	150Ω	1/2	23X20X151K	
R28	150Ω	1/2	23X20X151K	
R29	47Ω	1/2	23X20X470K	
R30	15KΩ	1/2	23X20X153K	
R31	100Ω	1/2	23X20X101K	
R32	150Ω	1/2	23X20X151K	
R33	220KΩ	1/2	23X20X224K	BTS-220K
R34	10KΩ	1/2	23X20X103K	BTS-10K
R35	22KΩ	1/2	23X20X223K	BTS-22K
R36	2200Ω	1	23X30X222K	BTA-2200
R37	1 Meg. 20%	2	23X20X105M	BTS-1 Meg.
R38	4700Ω	2	23X40X472K	BT-2-4700
R39	330KΩ	1/2	23X20X334K	BTS-330K
R40	47KΩ	1/2	23X20X473K	BTS-47K
R41	1 Meg. 20%	2	23X20X105M	BTS-1 Meg.
R42	47KΩ	1/2	23X20X473K	BTS-47K
R43	470KΩ 20%	1/2	23X20X474M	BTS-470K
R44	33KΩ	1/2	23X20X333K	BTS-33K
R45	10KΩ	1/2	23X20X103K	BTS-10K
R46	100KΩ 20%	1/2	23X20X104M	
R47	47KΩ	1/2	23X20X473K	BTS-47K
R48	150Ω	1/2	23X20X151K	

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6J6	6J6	7BF	
V2	Mixer	6J6	6J6	7BF	
V3	Oscillator	6J6	6J6	7BF	
V4	1st Video IF	6AU6	6AU6	7BK	
V5	2nd Video IF	6AU6	6AU6	7BK	
V6	3rd Video IF	6AU6	6AU6	7BK	
V7	Video Det. -1st Video Amp.	12AU7	12AU7	9A	
V8	2nd Video Amp. - DC Restorer -1st Sync. Sep.	12AU7	12AU7	9A	
V9	Sound IF	6AU6	6AU6	7BK	
V10	Ratio Det.	6AL5	6AL5	6BT	
V11	AF Amp.	6AV6	6AV6	7BT	
V12	Audio Output	6AQ5	6AQ5	7BZ	
V13	Sync. Amp. 2nd sync. Sep.	12AU7	12AU7	9A	
V14	Vert. Osc. -Vert Amp.	6SN7GT	6SN7GT	8HD	
V15	Hor. AFC Hor. Osc.	6SN7GT	6SN7GT	8BD	
V16	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1X2	1X2	7CB	
V19	LV Rectifier	5V4G	5V4G	5L	
V20A	Picture Tube	10BP4	10BP4	12D	Model 600
B	Picture Tube	12LP4	12LP4	12D	Models 518, 521, 601, 602
C	Picture Tube	16AP4	16AP4	12D	Models 519, 520, 603, 604

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA AEROVOX PART No.	REPLACEMENT DATA ERIE PART No.	REPLACEMENT DATA SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	45B137	PRSA450/40-40		TVL-6491	Filter-Red
B	40	450					Filter-Red
C2	80	450	45B158	PRSA450/40-40		TVL-9#	Filter
C3A	10	450	45B157	PRSA2222J		TVL-39#	Decoupling-Red
B	10	450					Decoupling-Red
C	10	450					Output Cathode Bypass-Blue
D	10	450					Decoupling-Yellow
C4A	100	250	45B156	PRSA20F30B			Decoupling-Red
B	150	50					Vert. Output Cathode Bypass-Yel.
C5	5	50	45A109	PRS150-4		TVA 13	Stabilizing Cap.
C6	330		47B20331K5	GP330M	GP2K-330		RF Coupling
C7	330		47B20331K5	GP330M	GP2K-330		RF Coupling
C8	1500		47B20152K5	GP1500M	GP2L-0015		AGC Filter
C9	1.5		47A160-3	CH.5CNPO	NPOK-1.5		Neutralizing
C10	1.5		47A160-3	CH.5CNPO	NPOK-1.5		Neutralizing
C11	500		47B20500K5	GP500M	GP2K-500		RF Filament Bypass
C12	1500		47B20152K5	GP1500M	GP2L-0015		Mixer Grid Filter
C13	4.7		47A160-6	CN4.7DN750	N750K-5		Osc. Feedback
C14	4.7		47A160-6	CN4.7DN750	N750K-5		Osc. Feedback
C15	500		47B20500K5	GP500M	GP2K-500		Osc. Filament Bypass
C16	500		47B20500K5	GP500M	GP2K-500		RF Bypass
C17	1.5		47A160-3	CH.5CNPO	NPOK-1.5		Fixed Trimmer
C18	5000		47A168	BPD-5	811-005	29C1	Mixer Plate Decoupling
C19	5000		47A168	BPD-5	811-005	29C1	AGC Filter
C20	5000		47A168	BPD-5	811-005	29C1	1st V. IF Decoupling
C21	5000		47A168	BPD-5	811-005	29C1	AGC Filter
C22	5000		47A168	BPD-5	811-005	29C1	2nd V. IF Decoupling
C23	5000		47A168	BPD-5	811-005	29C1	3rd V. IF Cathode Bypass
C24	5000		47A168	BPD-5	811-005	29C1	3rd V. IF Decoupling
C25	5000		47A168	BPD-5	811-005	29C1	3rd V. IF Plate Decoupling
C26	5		47B20050K5		NPOK-5	MS-55	V. Diode Filter
C27	.25	200	46A7254J	P488-25		TC-2	AGC Filter
C28	.05	200	46A7503J	P288-05		TM-15	Video Coupling
C29	.1	600	46AU104J	P688-1		TM-1	Video Coupling
C30	47		CH47JNPO	NPOM-50	NPOM-50	MS-45	Fixed Trimmer
C31	120	500	47X20A121M	1468-00015	GP2K-120	1FM-315	2nd V. Amp. Cathode Bypass
C32	.02	400	46A7203J	P488-02		TM-12	Video Coupling
C33	.25	200	46A7254J	P488-25		TC-2	DC Res. Cathode Bypass
C34	22	500	47X20A220K	1469-000025	GP1K-22	MS-425	Fixed Trimmer
C35	100		47X20A101M	GP100M	GP1K-100	1FM-31	S. IF Coupling
C36	5000		47A168	BPD-5	811-005	29C1	S. IF Screen Bypass
C37	5000		47A168	BPD-5	811-005	29C1	S. IF Plate Decoupling
C38	330		47B20331K5	GP330M	GP2K-330	1FM-335	Diode Load Cap. *
C39	330		47B20331K5	GP330M	GP2K-330	1FM-335	Diode Load Cap. *
C40	1000		47B20102M5	GP1000M	GP2L-001	1FM-21	De-emphasis
C41	.01	200	46A0502J	P488-01	821-01	TM-11	Audio Coupling †
C42	.01	400	46AU103J	P488-01	821-01	TM-11	Audio Coupling
C43	330	500	47X20A331M	1468-00035	GP2K-330	1FM-335	AF Amp. Plate Bypass
C44	.01	500	46AY103J	P688-01	821 01	TM-11	Audio Coupling
C45	.01	600	46A7103J	P688-01	821-01	TM-11	Output Plate Bypass
C46	.01	200	46AU103J	P488-01	821-01	TM-11	Sync. Coupling
C47	.1	200	46AU104J	P288-1		TM-1	2nd Sync. Amp. Cathode Bypass
C48	100		47X20A101M	GP100M	GP1K-100	1FM-31	Sync. Coupling
C49	1000	500	47X20A102M	1468-001	GP2L-001	1FM-21	2nd Sync. Sep. Cathode Bypass
C50	.002	600	46AZ202J	P688-002	GP2M-002	TM-22	Integrator Net.
C51	.005	200	46A0502J	P688-005	811-005	TM-25	Integrator Net.
C52	.005	200	46A0502J	P688-005	811-005	TM-25	Integrator Net.
C53	4700	500	47X35A472M	1467-005	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C54	.1	600	46AU104J	P688-1		TM-1	Vert. Discharge
C55	.25	600	46AZ254J	684-25		TC-2	Vert. Sweep Coupling
C56	180	500	47X20A181M	1468-0002	GP2K-180	1FM-32	Hor. Sync. Coupling
C57	220	500	4720A221M	1468-00025	GP2K-220	1FM-325	Voltage Divider

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA AEROVOX PART No.	REPLACEMENT DATA ERIE PART No.	REPLACEMENT DATA SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C58	.002	600	46AZ202J	P688-002	GP2M-002	TM-22	Hor. Sync. Coupling
C59	5		47B20050K5	CI5DNPO	NPOK-5	MS-55	Hor. Feedback
C60	.25	200	46A7254J	P488-25		TC-2	AFC Filter
C61	.02	600	46AY203J	P688-02		TM-12	AFC Filter
C62	.1	600	46AU104J	P688-1		TM-1	AFC Plate Bypass
C63	390	500	47X20A391M	1468-0004	GP2K-390	1FM-34	Hor. Osc. Grid Cap.
C64	10000	300	47X35A103K	1467-01	821-01	1FM-11	Fixed Trimmer
C65	1000	500	47X20A102M	1468-001	GP2L-001	1FM-21	Hor. Discharge
C66	1000	500	47X20A102M	1468-001	GP2L-001	1FM-21	Hor. Sweep Coupling
C67	390	500	47X20A391M	1468-0004	GP2K-390	1FM-34	Voltage Divider
C68	.05	600	47AY503J	P688-05		TM-15	Hor. Output Screen Bypass
C69	.25	200	46A7254J	P488-25		TC-2	Hor. Output Cathode Bypass
C70	1000		47B20102M5	GP1000M	GP2L-001	1FM-21	Hor. Output Cathode Bypass †
C71	68			GP68M	GP1K-68	MS-47	Hor. Feedback
C72	68			GP68M	GP1K-68	MS-47	Hor. Feedback
C73	.1	200	46AU104J	P288-1		TM-1	Fixed Trimmer
C74	1000		47B20102M5	GP1000M	GP2L-001	1FM-21	Fixed Trimmer †
C75	.05	600	46AY503J	P688-05		TM-15	Damper Filter
C76	.035	600	46AY353J	P688-033			Damper Filter
C77	1000		47B20102M5	GP1000M	GP2L-001	1FM-21	Damper Filter †
C78	500	20000	47A216				HV Filter
C79	500	20000	47A216				HV Filter
C80	.01	600	46BR103L6	P688-01	821-01	TM-11	Line Filter
C81	.01	600	46BR103L6	P688-01	821-01	TM-11	Line Filter
C82	.5	200	46A7254J	P288-5		TC-5	Hor. Sweep Coupling §
C83	.1	200	46AU104J	P288-1		TM-1	Pic. Tube Cathode Decoupling
C84	1000		47B20102M5	GP1000M	GP2L-001	1FM-21	Hor. Output Screen Bypass †

* When either item C38 or C39 are replaced, replace both with capacitors of equal value.
† Some models use .05MFD in this application.
‡ Not used in all models.
§ Some models use .25MFD in this application.
# Use mounting strap.
* Parallel sections to obtain desired capacity.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA IRC PART No.	REPLACEMENT DATA CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	1/2	25A856	Q13-137	AM-63-Z	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Attach to R1A per instructions
R2	10KΩ	2	25B790		25B790	Contrast control and switch-Wire Wound
R3	50KΩ	1/2	25A858	Q11-123	M-44-S	Brightness control
R4	2500Ω	2	25B710	W-3000	43-3000	Focus Control-Wire Wound
R5	5000Ω	1/2	25B712	Q11-114	M-19-S	Vert. linearity control
R6	2.5 Meg.	1/2	25B711	Q11-239	M-84-S	Height control
R7	1 Meg.	1/2	25A857	Q11-137	M-61-S	Vert. hold control
R8	50KΩ	1/2	25A858	Q11-123	M-44-S	Horiz. hold control

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA HALLICRAFTER PART No.	REPLACEMENT DATA IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R9	150Ω	1/2	23X20X151K		RF Grid
R10	150Ω	1/2	23X20X151K		RF Grid
R11	10KΩ	1/2	23X20X103K	BTS-10K	RF Plate Coil Shunt
R12	1000Ω 20%	1/2	23X20X102K	BTS-1000	RF Plate
R13	1000Ω 20%	1/2	23X20X102K	BTS-1000	RF Plate
R14	1000Ω 20%	1/2	23X20X102K	BTS-1000	AGC Network
R15	5600Ω	1/2	23X20X562K	BTS-5600	Mixer Grid Shunt
R16	1 Meg. 20%	1/2	23X20X105K	BTS-1 Meg.	Mixer Grid
R17	100KΩ 20%	1/2	23X20X104K	BTS-100K	Osc. Grid
R18	100KΩ 20%	1/2	23X20X104K	BTS-100K	Osc. Grid
R19	1000Ω 20%	1/2	23X20X102K	BTS-1000	Osc. Plate
R20	1000Ω 20%	1/2	23X20X102K	BTS-1000	Osc. Plate
R21	33Ω	1/2	23X20X330K		Parasitic Supp.
R22	4700Ω	1/2	23X30X472K		Mixer Plate Decoupling
R23	15KΩ	1/2	23X20X153K		1st Video IF Transformer Shunt
R24	47Ω	1/2	23X20X470K		1st Video IF Cathode
R25	15KΩ	1/2	23X20X153K		2nd Video IF Transformer Shunt
R26	100Ω	1/2	23X20X101K		Decoupling
R27	150Ω	1/2	23X20X151K		AGC Network
R28	150Ω	1/2	23X20X151K		AGC Network
R29	47Ω	1/2	23X20X470K		2nd Video IF Cathode
R30	15KΩ	1/2	23X20X153K		3rd Video IF Transformer Shunt
R31	100Ω	1/2	23X20X101K		Decoupling
R32	150Ω	1/2	23X20X151K		3rd Video IF Cathode
R33	220KΩ	1/2	23X20X224K	BTS-220K	AGC Network
R34	10KΩ	1/2	23X20X103K	BTS-10K	Video Det. Load
R35	22KΩ	1/2	23X20X223K	BTS-22K	Peaking Coil Shunt
R36	2200Ω	1	23X30X222K	BTA-2200	1st Video Amp. Plate
R37	1 Meg. 20%	1/2	23X20X105M	BTS-1 Meg.	2nd Video Amp. Grid-See Note 1
R38	4700Ω	2	23X40X472K	BT-2-4700	2nd Video Amp. Plate
R39	330KΩ	1/2	23X20X334K	BTS-330K	DC Rest. Load
R40	47KΩ	1/2	23X20X473K	BTS-47K	1st Sync. Sep. Grid
R41	1 Meg. 20%	1/2	23X20X105M	BTS-1 Meg.	1st Sync. Sep. Grid
R42	47KΩ	1/2	23X20X473K	BTS-47K	1st Sync. Sep. Plate-See Note 4
R43	470KΩ 20%	1/2	23X20X474M	BTS-470K	Picture Tube Grid
R44	33KΩ	1/2	23X20X333K	BTS-33K	Sound IF Grid
R45	10KΩ	1/2	23X20X103K	BTS-10K	Sound IF Plate Decoupling
R46	100KΩ 20%	1/2	23X20X104M		Sound IF Screen
R47	47KΩ	1/2	23X20X473K	BTS-47K	Voltage Divider
R48	150Ω	1/2	23X20X151K		Balancing

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA IRC PART No.	IDENTIFICATION CODES
R49	10KΩ 5%	1/2	23X20X103J	BTS-10K-5%	Ratio Det. Diode Load
R50	10KΩ 5%	1/2	23X20X103J	BTS-10K-5%	Ratio Det. Diode Load
R51	33KΩ	1/2	23X20X333K	BTS-33K	De-emphasis
R52	4.7Meg. 20%	1/2	23X20X475M	BTS-4.7 Meg.	AF Grid
R53	470KΩ 20%	1/2	23X20X474M	BTS-470K	AF Plate
R54	100KΩ 20%	1/2	23X20X104M	BTS-100K	Output Grid
R55	330Ω	1	23X30X331K	BTA-330	Output Cathode
R56	5000Ω	10	24BG502E	AB-5000	Filter-Wire Wound
R57	180KΩ	1/2	23X20X184M	BTS-180K	Voltage Divider
R58	15KΩ	1/2	23X20X153K	BTS-15K	Voltage Divider-See Note 5
R59	1 Meg. 20%	1/2	23X20X105M	BTS-1 Meg.	Sync. Amp. Grid
R60	10KΩ	1/2	23X20X103K	BTS-10K	Sync. Amp. Cathode
R61	47KΩ	1/2	23X20X473K	BTS-47K	Sync. Amp. Plate
R62	2.2 Meg.	1/2	23X20X225K	BTS-2.2 Meg.	2nd Sync. Sep. Grid
R63	2200Ω	1/2	23X20X222K	BTS-2200	2nd Sync. Sep. Cathode
R64	22KΩ	1/2	23X20X223K	BTS-22K	Integrator
R65	8200Ω	1/2	23X20X822K	BTS-8200	Integrator
R66	8200Ω	1/2	23X20X822K	BTS-8200	Integrator
R67	1 Meg.	1/2	23X20X105K	BTS-1 Meg.	Vert. Osc. Grid-See Note 2
R68	6.8 Meg.	1/2	23X20X685M	BTS-6.8 Meg.	Voltage Divider-See Note 3
R69	100KΩ	1/2	23X20X104K	BTS-100K	Voltage Divider-See Note 3
R70	1 Meg.	1/2	23X20X105M	BTS-1 Meg.	Vert. Osc. Plate
R71	3300Ω	1/2	23X20X332K	BTS-3300	Vert. Peaking
R72	2.2 Meg.	1/2	23X20X225M	BTS-2.2 Meg.	Vert. Amp. Grid
R73	820KΩ 20%	1/2	23X20X824M	BTS-820K	Horiz. AFC Grid
R74	150KΩ 20%	1/2	23X20X154M	BTS-150K	Horiz. AFC Cathode
R75	150KΩ	1	23X30X154M	BTA-150K	Horiz. AFC Cathode
R76	8200Ω	1/2	23X20X822K	BTS-8200	Horiz. AFC Filter Network
R77	82KΩ	1/2	23X20X823K	BTS-82K	Voltage Divider
R78	120KΩ 20%	1/2	23X20X124M	BTS-120K	Voltage Divider
R79	2.7 Meg.	1	23X30X275M	BTA-2.7 Meg.	Voltage Divider
R80	100KΩ	1	23X30X104K	BTA-100K	Horiz. Osc. Grid
R81	8200Ω	1/2	23X20X822K	BTS-8200	Horiz. Osc. Transformer Shunt
R82	22KΩ	1/2	23X20X223K	BTS-22K	Horiz. Osc. Transformer Shunt
R83	120KΩ 20%	1/2	23X20X124M	BTS-120K	Horiz. Osc. Plate
R84	150KΩ	1/2	23X20X154M	BTS-150K	Horiz. Osc. Filter Network
R85	18KΩ	1	23X30X183K	BTA-18K	Decoupling
R86	560KΩ	1/2	23X20X564K	BTS-560K	Feedback
R87	47Ω	1/2	23X20X470K		Parasitic Supp.
R88	470KΩ 20%	1/2	23X20X474M	BTS-470K	Horiz. Output Grid
R89	100Ω	1	23X30X100K	BW-1-100	Horiz. Output Cathode
R90	39KΩ	2	23X40X393K	BT-2-39K	Horiz. Output Screen
R91	39KΩ	2	23X40X393K	BT-2-39K	Horiz. Output Screen
R92	10KΩ	1	23X30X103K	BTA-10K	Filter
R93	2200Ω	1	23X30X222K	BTA-2200	Decoupling
R94	1 Meg.	1	23X30X105K		HV Filter
R95	200Ω	10	24BH201E	AB-200	Filter-Wire Wound
R96	39Ω	1	23X30X390K		Parasitic Supp. -See Note 3
R97	47Ω	1/2	23X20X470K		Osc. Cathode
R98	5600Ω	1	23X30X562K	BTA-5600	Voltage Divider -See Note 6

Note 1. Some models use 220KΩ resistor in this application.
Note 2. Some models use 1.2 Meg. resistor in this application.
Note 3. Not used in all models.
Note 4. Models 603 and 604 use 27KΩ resistor in this application.
Note 5. Models 603 and 604 use 22KΩ resistor in this application.
Note 6. Used in models 603 and 604 only.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA HALLICRAFTERS PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.
T1	117VAC @ 1.35A	670VCT @ .170 ADC	5VAC @ 2A	6.3VAC @ 7.4A SEC. 4 6.3VAC @ 1.2A	52C185			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA HALLICRAFTER PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	NOTES
T2	200Ω	1200Ω	55B115	A-8111	A-3000	TBO-1	Vert. Block Osc. Trans.
T3	348Ω Tap ④ 48Ω	SEC. 1 50 Tap ④ .2Ω & 4.1Ω	55C133				Hor. Output Trans.
T4	1100Ω Tap ④	12.5Ω	55A128	A-8112	A-3037	TSC-5	Vert. Output Trans.
T5A	15Ω		53A180	DY-1			Hor. Deflection Coil
B	68Ω						Vert. Deflection Coil
T6A	1000Ω		51B1157 ①				Focus Coil
B			51B1158 ②				Focus Coil
C			51B1159 ③				Focus Coil

① Used in model 600
② Used in models 601 and 602.
③ Used in models 603 and 604.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Hallicrafters	STANCOR	MERIT	CHICAGO	
	PRI.	SEC.	PRI.	SEC.	PART No.	PART No.	PART No.	PART No.	
T7	6.6KΩ	3.5Ω	365Ω	.5Ω	55C134	A-3878	A-2931	RO-13	

SPEAKER

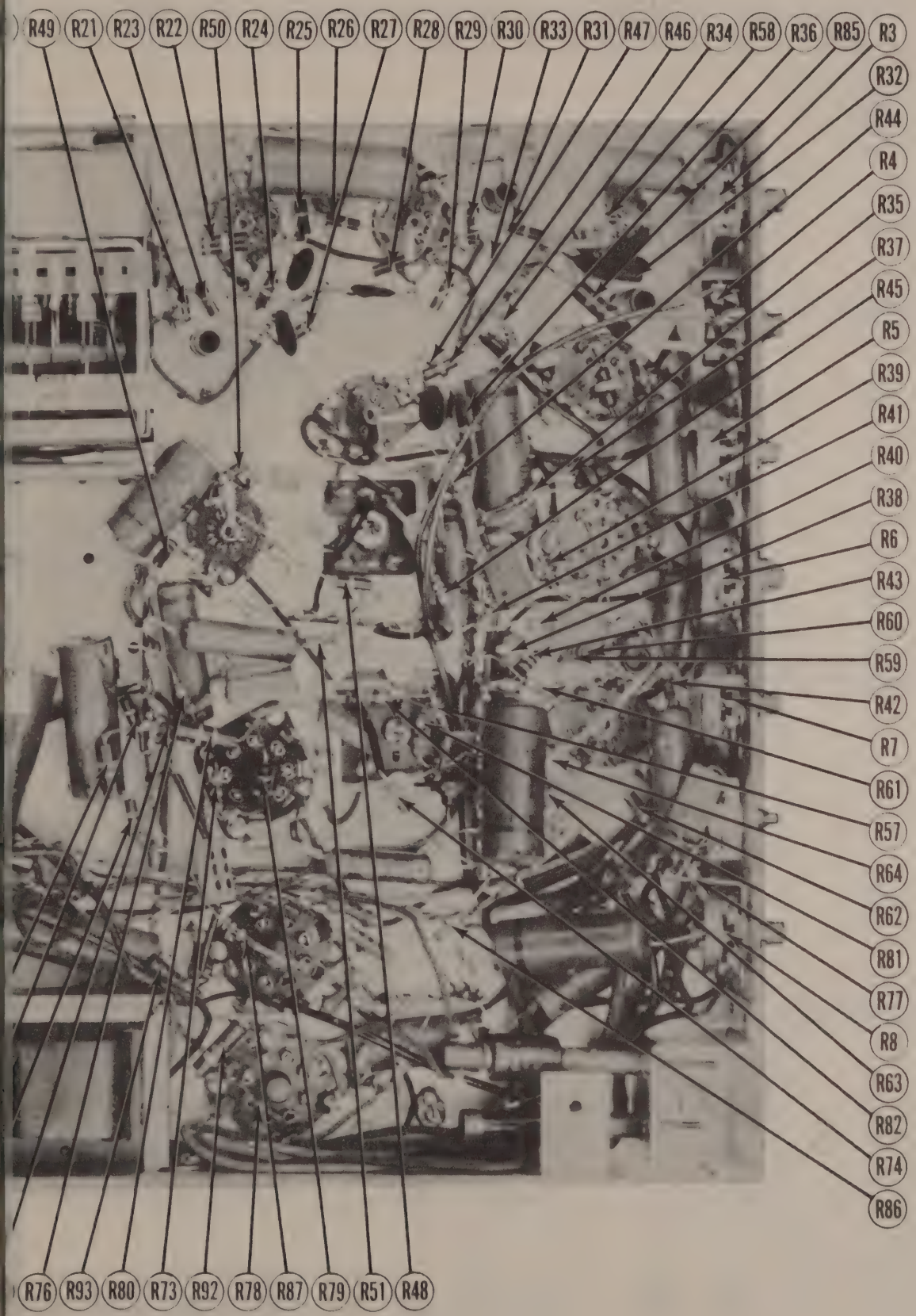
ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
			HALLICRAFTER	VIKING	QUAM	
	FIELD RES.	V. C. IMP.	PART No.	PART No.	PART No.	
SP1A B	PM	3.5Ω	85A095 ④ 85C096 ⑤	46J6	46A1	④ Used in models 600 and 601. ⑤ Used in models 602, 603, 604.
	CONE DIA.	V. C. DIA.				
SP2	3 7/8" x 5 7/8"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
				Hallicrafters	MEISSNER	
		PRI.	SEC.	PART No.	PART No.	
L1	Ant. Input	0Ω				Part of tuner.
L2	Ant. Coil	0Ω				Part of tuner, low-band
L3	Ant. Coil	0Ω				Part of tuner, high-band
L4	Mixer Grid	0Ω				Part of tuner, low-band
L5	Mixer Grid	0Ω				Part of tuner, high-band
L6	Osc. Coil	0Ω				
L7	Osc. Coil	0Ω				Part of tuner, low-band
L8	1st Video IF	.2Ω	.2Ω	50A431		Part of tuner, high-band
L9	2nd Video IF	.2Ω	.2Ω	50A431		
L10	3rd Video IF	.2Ω	.2Ω	50A431		
L11	4th Video IF	.2Ω	.2Ω	50A431		
L12	Peaking	8.5Ω		51B1154		Wound on 1 Meg. resistor.
L13	Peaking	8.5Ω		51B1154		Wound on 1 Meg. resistor.
L14	Peaking	17Ω		51A1155		Wound on 1 Meg. resistor.
L15	Peaking	10.5Ω		51A1156		Wound on 1 Meg. resistor.
L16	Sound IF	1Ω	.8Ω	50A432		
L17	Ratio Det. Trans.	4.5Ω	1Ω	50B406		
L18	Hor. Osc. Trans.	120Ω	36Ω	51B1153		
L19	Width Cont.	.2Ω		51B1072-1		
L20	Horiz. Linearity	38Ω		51B1071		
L21	Peaking			51A1156		Used in 603 and 604.

MISCELLANEOUS

ITEM No.	PART NAME	HALLICRAFTERS PART No.	NOTES
M1	RF Tuner	1C834	Complete
M2	Fuse	39A340	3A
M3	Fuse	39A338	.25A, 250V (Not used in all models)
M4	Ion Trap	21A093	Permanent Magnet Type
	Cabinet Back	8D944	Model 600
	Cabinet Back	8D947	Model 601
	Safety Glass	22D256	Model 600
	Safety Glass	22D255	Model 601
	Safety Glass	22A260	Model 602
	Knob	15B180	On-Off, Contrast
	Knob	15B181	Channel Selector
	Knob	15B182	Fine Tuning
	Trimmer	44A361	Horiz. Drive



ESISTOR IDENTIFICATION

PHOTOFACT* Folder

*TRADE MARK

MOTOROLA MODELS 10T2, 10VK12, 10VK22, 10VT10, 10VT24, 12K1, 12K2, 12T1, 12VF4, 12VF26, 12VK11, 12VT13

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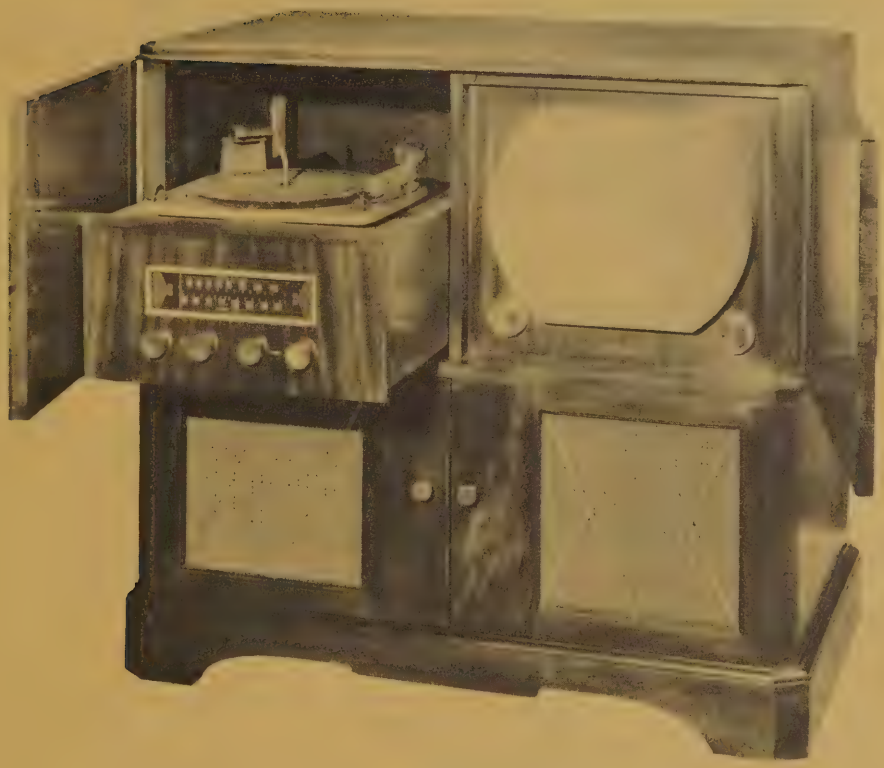

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PHOTOFACT* Folder
*TRADE MARK

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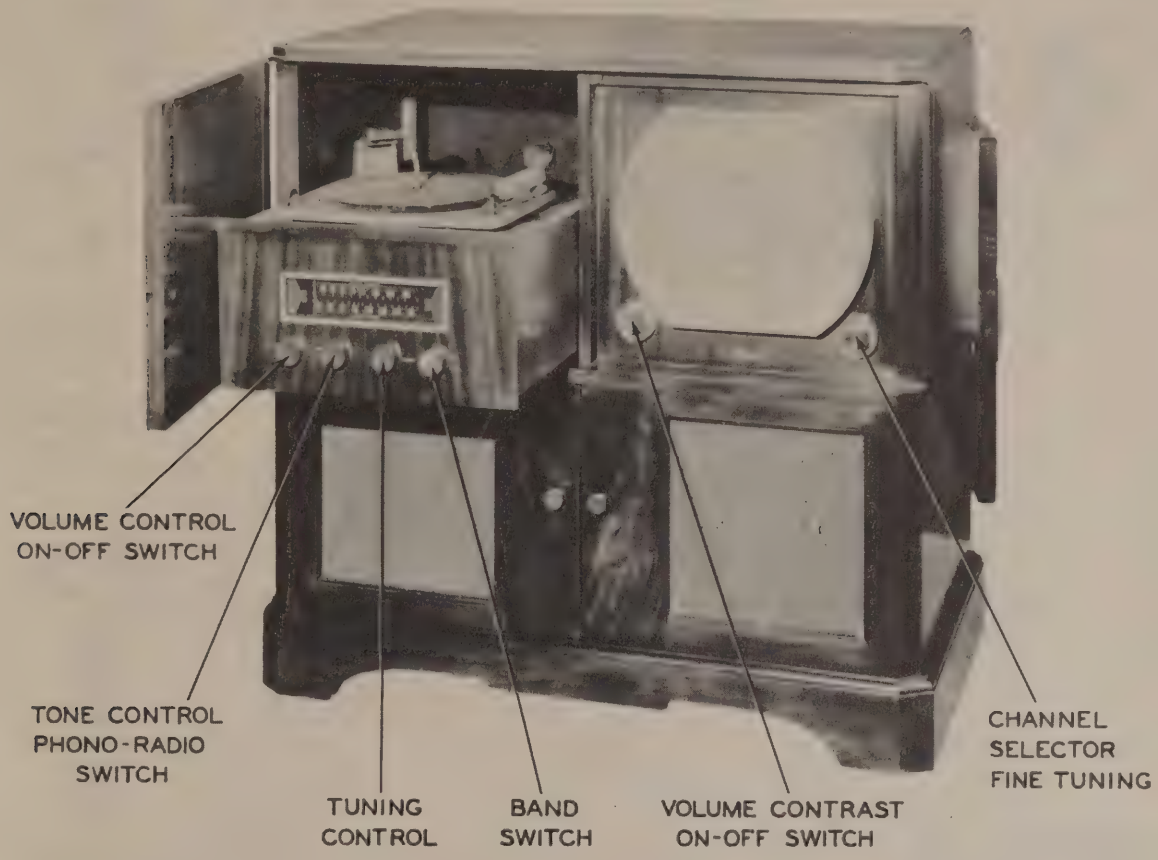

MOTOROLA MODELS 10T2, 10VK12, 10VK22, 10VT10, 10VT24, 12VF4, 12VK11, 12VT13

MOTOROLA MODEL 12VF4R

TRADE NAME	Motorola, Models 10T2, 10VK12, 10VK22, 10VT10, 10VT24 (Ch. TS14, A, B), 12K1, 12K2, 12T1, 12VF4, 12VF26, 12VK11, 12VT23 (Ch. TS23, A, B)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Illinois
TYPE SET	Television Receiver (Model 12VF4R Also Has AM-FM Radio Chassis HS-178)
TUBES	Nineteen ("TV Only" Models) Twenty Five (Model 12VF4R)
POWER SUPPLY	110-120 Volts AC-60 Cycle
TUNING RANGE	Channels 2 thru 13 RATING 1.35 Amp. at 117 Volts AC (TV Only).

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FOR SERVICE INFORMATION ON RADIO CHASSIS HS-190, A SEE CHASSIS HS-178 PHOTOFACT SET #88 - FOLDER #7

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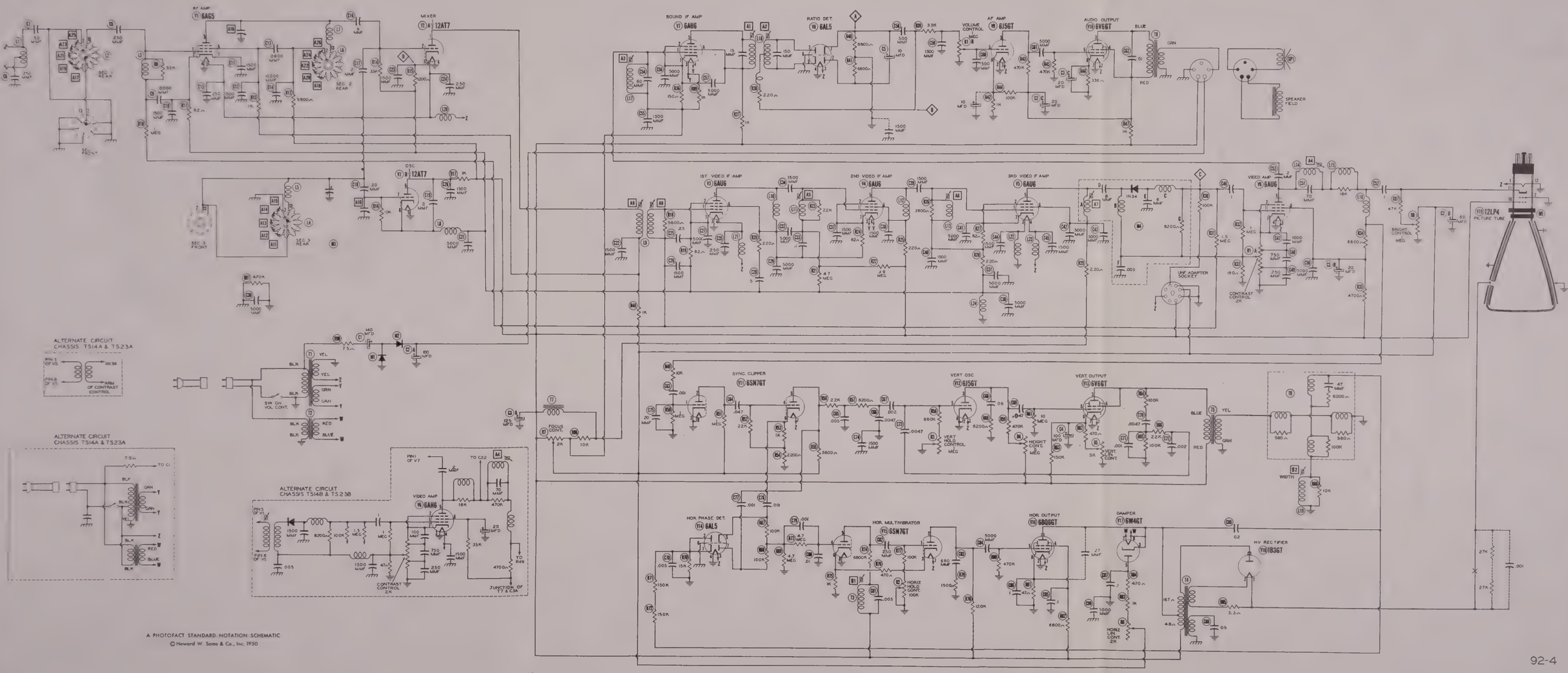
RF AMP V1 6AG5
MIXER V2 12AT7
OSC V3 12AT7
SOUND IF AMP V7 6AU6
RATIO DET. V8 6AL5
AF AMP V9 6J5GT
AUDIO OUTPUT V10 6V6GT
SPEAKER FIELD
1ST VIDEO IF AMP V7 6AU6
2ND VIDEO IF AMP V4 6AU6
3RD VIDEO IF AMP V5 6AU6
VIDEO AMP V6 6AU6
12LP4 PICTURE TUBE
SYNC. CLIPPER V11 6SN7GT
VERT. OSC V12 6J5GT
VERT. OUTPUT V13 6V6GT
HOR. PHASE DET. V14 6AL5
HOR. MULTIVIBRATOR V15 6SN7GT
HOR. OUTPUT V16 6BQ6GT
DAMPER V17 6W4GT
HV RECTIFIER V18 1B3GT
ALTERNATE CIRCUIT CHASSIS TS14A & TS23A
ALTERNATE CIRCUIT CHASSIS TS14A & TS23A
ALTERNATE CIRCUIT CHASSIS TS14B & TS23B
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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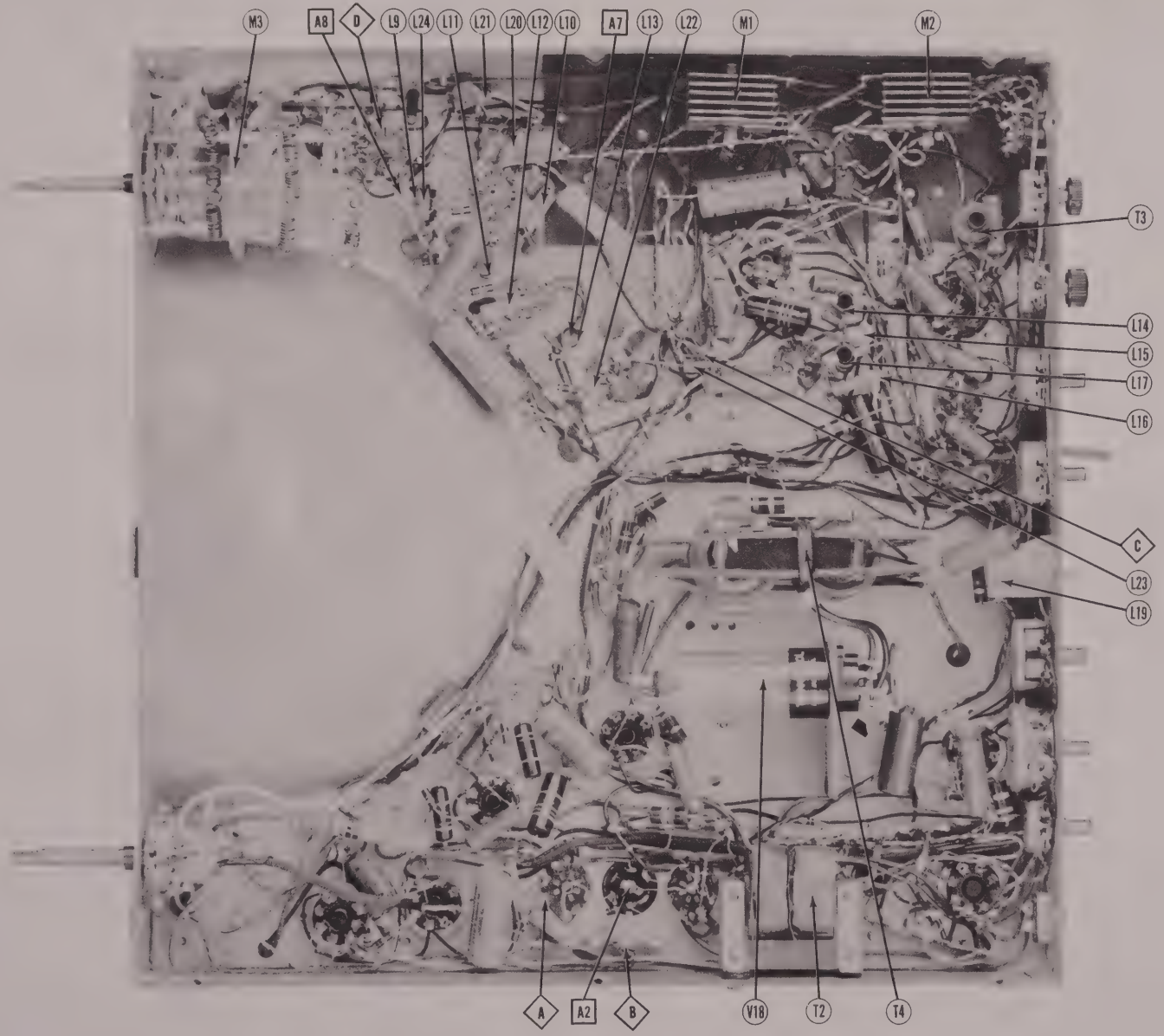
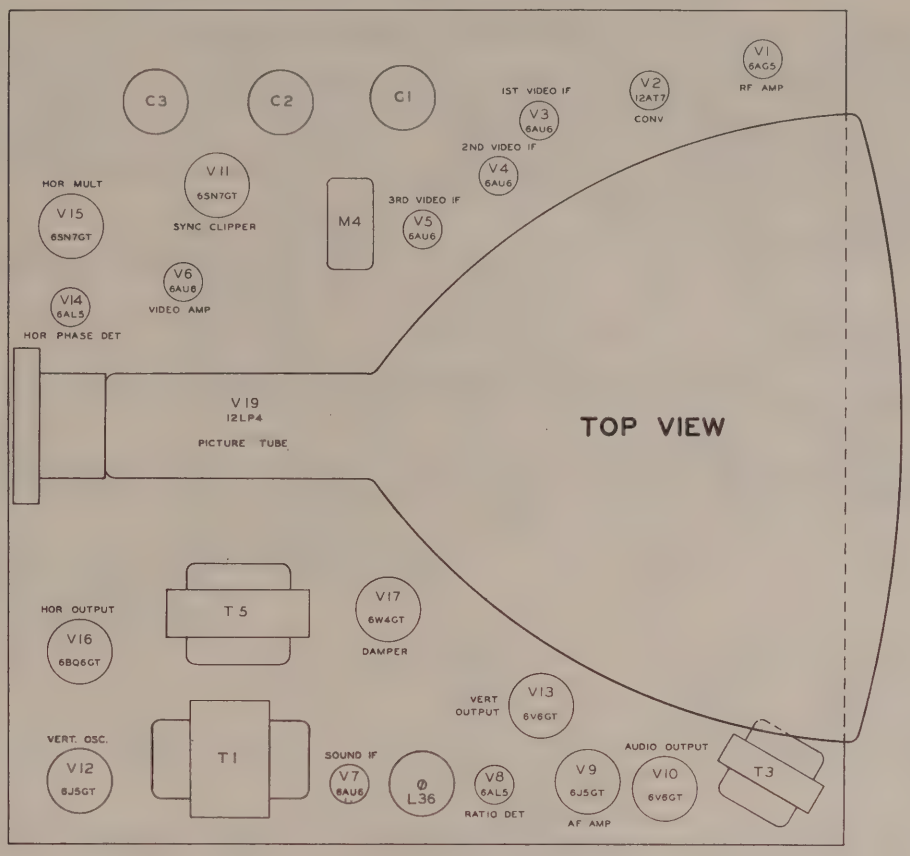
92-4

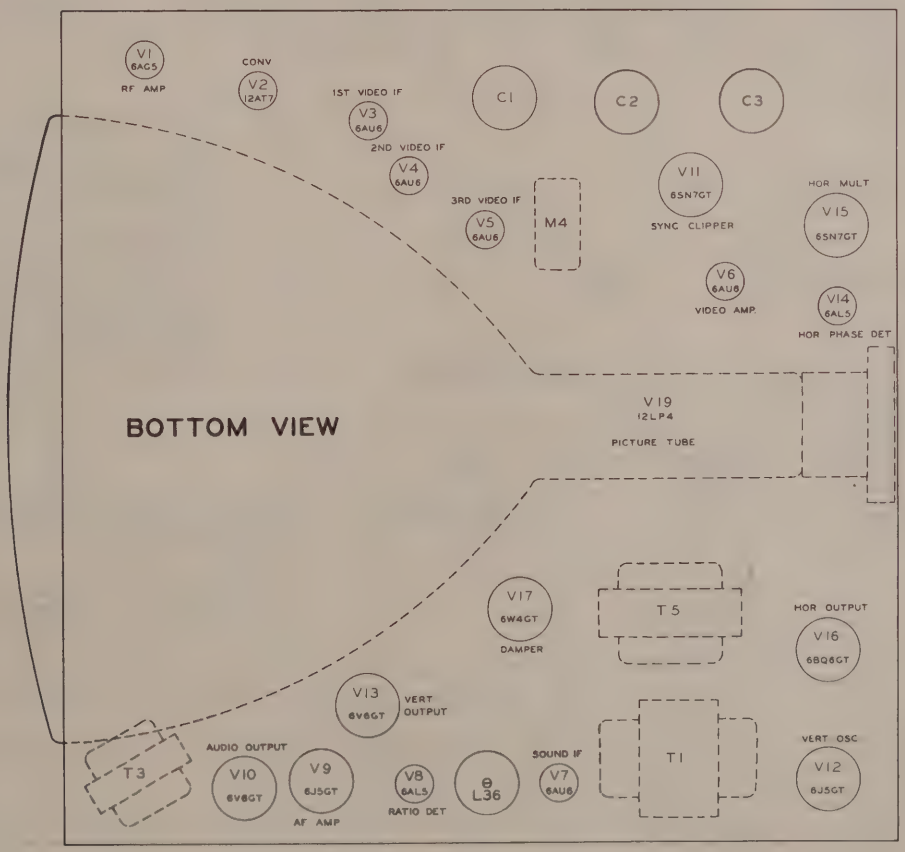
MOTOROLA MODELS 10T2, 10VK12, 10VK22, 10VT10, 10VT24, 12VF4, 12VK11, 12VT13

CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V15) from its socket.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	1000MMF	High side to pin 1 (Grid) of 6AU6 (V7). Low side to B-.	4.5MC (Unmod.)	Any channel not used locally	DC Probe thru 10KΩ to Point (A). Common to B-.	A1	Adjust for maximum deflection.
2.	1000MMF	"	"	"	DC Probe thru 10KΩ to Point (B). Common to B-.	A2	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
3.	1000MMF	High side to pin 1 (Grid) of 6AU6 (V6). Low side to B-.	"	"	DC Probe thru 10KΩ to Point (A). Common to B-.	A3	Adjust for maximum deflection.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1000MMF	High side to pin 1 (Grid) of 6AU6 (V6) Low side to B-.	4.5MC (450KC SWP)	4.5MC	Any channel not used locally	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.	A1, A3	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry as per Fig 1.
2.	1000MMF	"	"	"	"	Vert. Amp. thru 10KΩ to Point (B). Low side to B-.	A2, A1	Reconnect capacitor C5. Adjust A2 so 4.5MC occurs at center of crossover lines as per Fig 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines. Continue with step 4.

4.5MC TRAP ADJUSTMENT

Conctruct a detector probe as shown in figure 3.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	1000MMF	High side to pin 1 (Grid) of 6AU6 (V6). Low side to B-.	4.5MC (400 ∿ Mod.)	Any channel not used locally	DC Probe thru crystal detector (Fig 3) to pin 11 (cathode) of picture tube (V19). Common to B-.	A4	Adjust for MINIMUM deflection.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery through 4700Ω to the junction of C25 and C26, connect the positive lead to B-.
Unsolder one end of the oscillator cathode choke (L8) to disable the local oscillator.
Set the contrast control to slightly less than maximum clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V3). Low side to AGC line (opposite end of R18).	24.6MC (10MC SWP)	22.9MC 26.3MC	Any	Vert. Amp. to Point (C). Low side to B-.	A5	Adjust for maximum amplitude near 26MC
6.	.01MFD	"	"	"	"	"	A6	Adjust for maximum amplitude near 24.6MC
7.	.01MFD	"	"	"	"	"	A7	Adjust to place 22.9MC marker at 50% on the low frequency side of response curve as shown in Fig 4.
8.	.01MFD	"	"	"	"	"	A5	Adjust to place in Fig 4 marker at 50% on high side of response curve.
9.	.01MFD	High side to pin 2 (Grid) of 12AT7 (V2). Low side to B-.	"	23.1MC 26.1MC	"	"	A8, A9	Turn both cores fully out (counter-clockwise) then turn both in simultaneously until 23.1 MC marker and 26.3MC marker appear at 50% response as shown in Fig 5. If a dip occurs in the response curve, it should not exceed 10%.

OSCILLATOR ALIGNMENT

Set the fine tuning control to the mid-position of its range.
Reconnect the oscillator cathode choke (L8).
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	170.5MC (Unmod.)	10	Vert. Amp. thru 10KΩ to Point (D). Low side to B-.	A10	Adjust for zero beat on scope face as indicated by a narrow trace between two wide traces as the circuit is tuned thru resonance.
11.	"	"	188.15MC 182.15MC 176.15MC 164.15MC 158.15MC 152.15MC	13 12 11 9 8 7	"	L7	Check all high band channels to see if zero beat occurs within 45% of the mid position of the fine tuning control range. If necessary expand or compress the coil turns of L7 to obtain optimum results. If L7 is changed repeat steps 10 and 11
12.	"	"	109.35MC	6	"	A11	Expand or compress coil turns as explained in step 10.
13.	"	"	103.35MC	5	"	A12	"
14.	"	"	93.35MC	4	"	A13	"
15.	"	"	87.35MC	3	"	A14	"
16.	"	"	81.35MC	2	"	A15	"

ALIGNMENT INSTRUCTIONS (CONT.)

ANTENNA AND RF ALIGNMENT

The sweep generator output lead should be terminated with its characteristic impedance usually 50 ohms.
Unsolder one end of the oscillator cathode choke (L8).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	195MC (10MC SWP)	193.25MC 197.75MC	10	Vert. Amp. thru 10KΩ to Point ◇. Low side to B-.	A16	Expand or compress coil turns for response curve similar to Fig 6.
18.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"	L5	Check all high band channels for response similar to Fig 6. If necessary expand or compress turns of coil L5 for proper response on channels 11, 12 and 13. If L5 is altered repeat steps 10 and 11.
			207MC (10MC SWP)	205.25MC 209.75MC	12			
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
19.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A17 A18	Expand or compress coil turns for response curve similar to Fig. 7 .
			79MC (10MC SWP)	77.25MC 81.75MC	5		A19 A20	Note that the antenna coil affects the position of the video marker and the RF coil affects the position of the sound marker.
			69MC (10MC SWP)	67.25MC 71.75MC	4		A21 A22	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A23 A24	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A25 A26	

FIG. 1

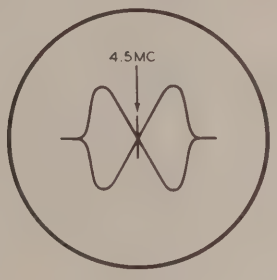


FIG. 2

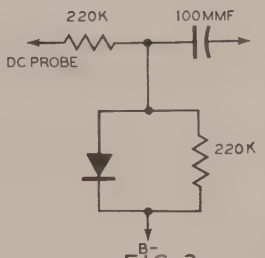


FIG. 3

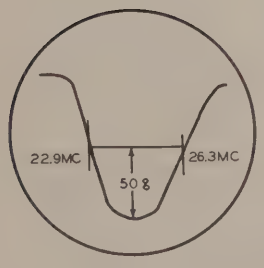


FIG. 4

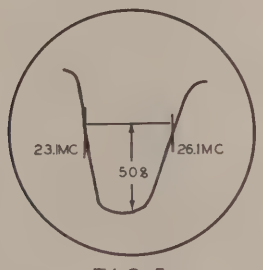


FIG. 5

FIG. 6

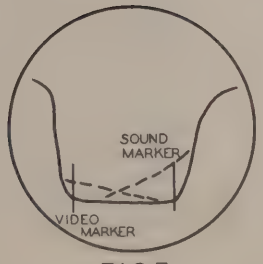


FIG. 7

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.2VDC	1.1VDC	6.3VAC	0V.	182VDC	180VDC	1.1VDC		
V 2	12AT7	185VDC	-6VDC	5.6VDC	0V.	0V.	230VDC	§-7.3VDC	.1VDC	6.3VAC
V 3	6AU6	-.2VDC	.6VDC	0V.	6.3VAC	135VDC	135VDC	.6VDC		
V 4	6AU6	▰-.2VDC	▰.6VDC	#210VDC	#210VDC	▰100VDC	▰100VDC	▰.6VDC		
V 5	6AU6	3.2VDC	4.5VDC	0V.	6.3VAC	187VDC	187VDC	4.5VDC		
V 6	6AU6	0V.	5.4VDC	6.3VAC	0V.	205VDC	220VDC	5.4VDC		
V 7	6AU6	▲0Ω	▲.4Ω	#210VDC	#210VDC	▲33VDC	▲33VDC	▲.4VDC		
V 8	6AL5	.2VDC	-.3VDC	6.3VAC	0V.	0V.	0V.	0V.		
V 9	6J5GT	.1VDC	0V.	42VDC	0V.	0V.	0V.	6.3VAC	2.4VDC	
V 10	6V6GT	0V.	6.3VAC	195VDC	200VDC	0V.	0V.	0V.	10VDC	
V 11	6SN7GT	-2.4VDC	11VDC	0V.	10VDC	165VDC	16VDC	6.3VAC	0V.	
V 12	6J5GT	.1VDC	6.3VAC	25VDC 140VDC	0V.	-17VDC -24VDC	0V.	0V.	0V.	
V 13	6V6GT	0V.	6.3VAC	235VDC	235VDC	0V.	162VDC	0V.	5VDC 32VDC	
V 14	6AL5	0V.	0V.	6.3VAC	0V.	.9VDC	0V.	-4VDC		
V 15	6SN7GT	-1.2VDC -2.4VDC	130VDC	8VDC	0V.	215VDC	7.6VDC	6.3VAC	0V.	
V 16	6BQ6GT	0V.	0V.	0V.	140VDC	-13VDC	130VDC	6.3VAC	5.1VDC	TOP CAP *
V 17	6W4GT	0V.	0V.	270VDC	60VDC	45VDC	0V.	270VDC	270VDC	
V 18	1B3GT	* DO NOT MEASURE.								
V 19	12LP4	6.3VAC	0V.	PIN 10 270VDC	PIN 11 160VDC	PIN 12 0V.				

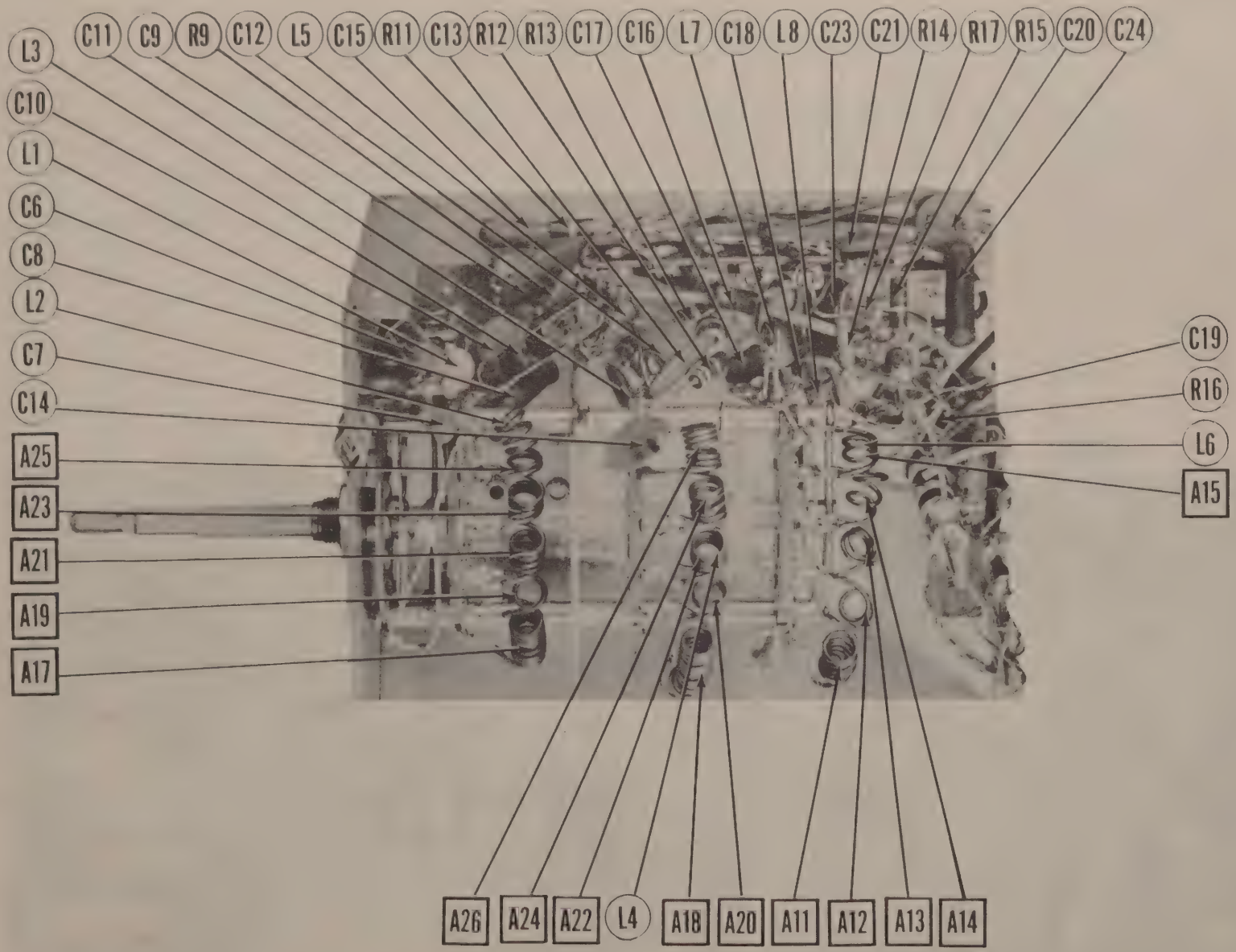
§ TAKEN WITH VACUUM TUBE VOLTMETER.
# 6.3 VAC MEASURED ACROSS FILAMENTS.
▲ MEASURED FROM PIN 4 OF V4.
▰ MEASURED FROM PIN 6 OF V3.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	2.5 Meg.	82Ω	.1Ω	0Ω	†4.5KΩ	†4KΩ	82Ω		
V 2	12AT7	†3KΩ	33KΩ	1.2KΩ	0Ω	0Ω	†1000Ω	10KΩ	3.5Ω	.1Ω
V 3	6AU6	2.5 Meg.	82Ω	0Ω	.1Ω	▰.2Ω	▰0Ω	82Ω		
V 4	6AU6	2 Meg.	▰82Ω	▲.1Ω	▲0Ω	†280Ω	†280Ω	▰82Ω		
V 5	6AU6	220Ω	300Ω	0Ω	.1Ω	†2KΩ	†2KΩ	300Ω		
V 6	6AU6	1 Meg.	1000Ω	.1Ω	0Ω	†12KΩ	†5KΩ	1000Ω		
V 7	6AU6	▲1000Ω	▲1.2KΩ	▲0Ω	▲.1Ω	†1.1KΩ	†1.1KΩ	▲1.2KΩ		
V 8	6AL5	6.8KΩ	6.8KΩ	.1Ω	0Ω	1 Meg.	0Ω	1 Meg.		
V 9	6J5GT	470KΩ	0Ω	†470KΩ	Inf.	13Ω	Inf.	.1Ω	1000Ω	
V 10	6V6GT	Inf.	.1Ω	†1.5KΩ	†1.1KΩ	470KΩ	0Ω	0Ω	330Ω	
V 11	6SN7GT	1 Meg.	†1 Meg.	0Ω	24KΩ	†7.6KΩ	3.2KΩ	.1Ω	0Ω	
V 12	6J5GT	470KΩ	.1Ω	†5.5Meg. †580KΩ	Inf.	1.6Meg. 680KΩ	Inf.	0Ω	0Ω	
V 13	6V6GT	130KΩ	.1Ω	†800Ω	†800Ω	10 Meg.	†36KΩ	0Ω	5.5KΩ 470Ω	
V 14	6AL5	15KΩ	15KΩ	.1Ω	0Ω	4.8 Meg.	0Ω	4.8 Meg.		
V 15	6SN7GT	200KΩ 100KΩ	†150KΩ	1.5KΩ	9.5 Meg.	†7KΩ	1000Ω	.1Ω	0Ω	
V 16	6BQ6GT	Inf.	0Ω	Inf.	†6.8KΩ	470KΩ	1.2 Meg.	.1Ω	47Ω	TOP CAP †130Ω
V 17	6W4GT	Inf.	Inf.	†130Ω	†5KΩ	†5.5KΩ	Inf.	†130Ω	†130Ω	
V 18	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf	Inf.	Inf.	Inf.	TOP CAP †300Ω
V 19	12LP4	.1Ω	0Ω	PIN 10 †100Ω	PIN 11 300KΩ 50KΩ	PIN 12 0Ω				

† MEASURED FROM OUTPUT OF M1.
▰ MEASURED FROM PIN 6 OF V3.
▲ MEASURED FROM PIN #4 OF V4

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.


C11
C9
R9
C12
L5
C15
R11
C13
R12
R13
C17
C16
L7
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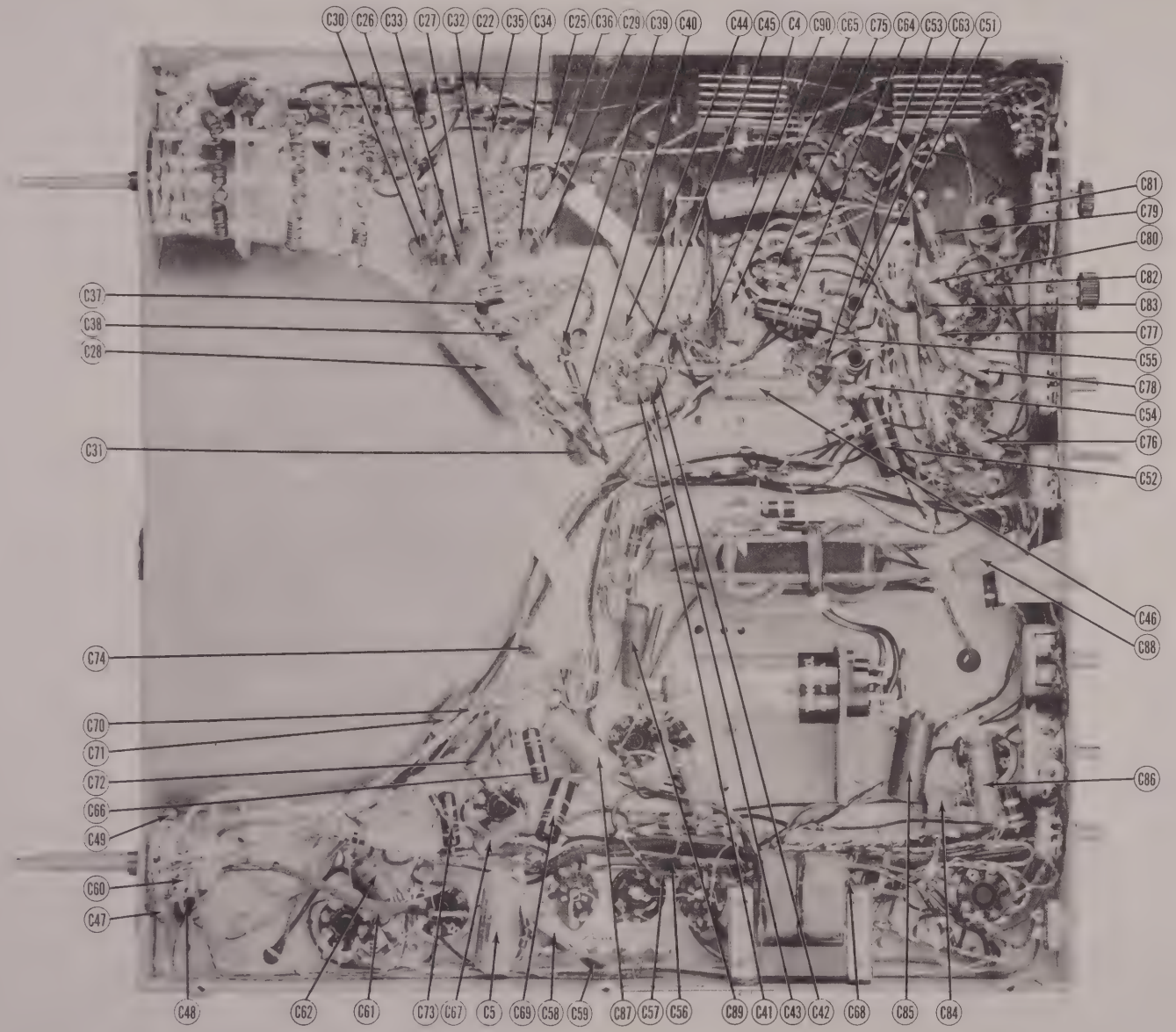
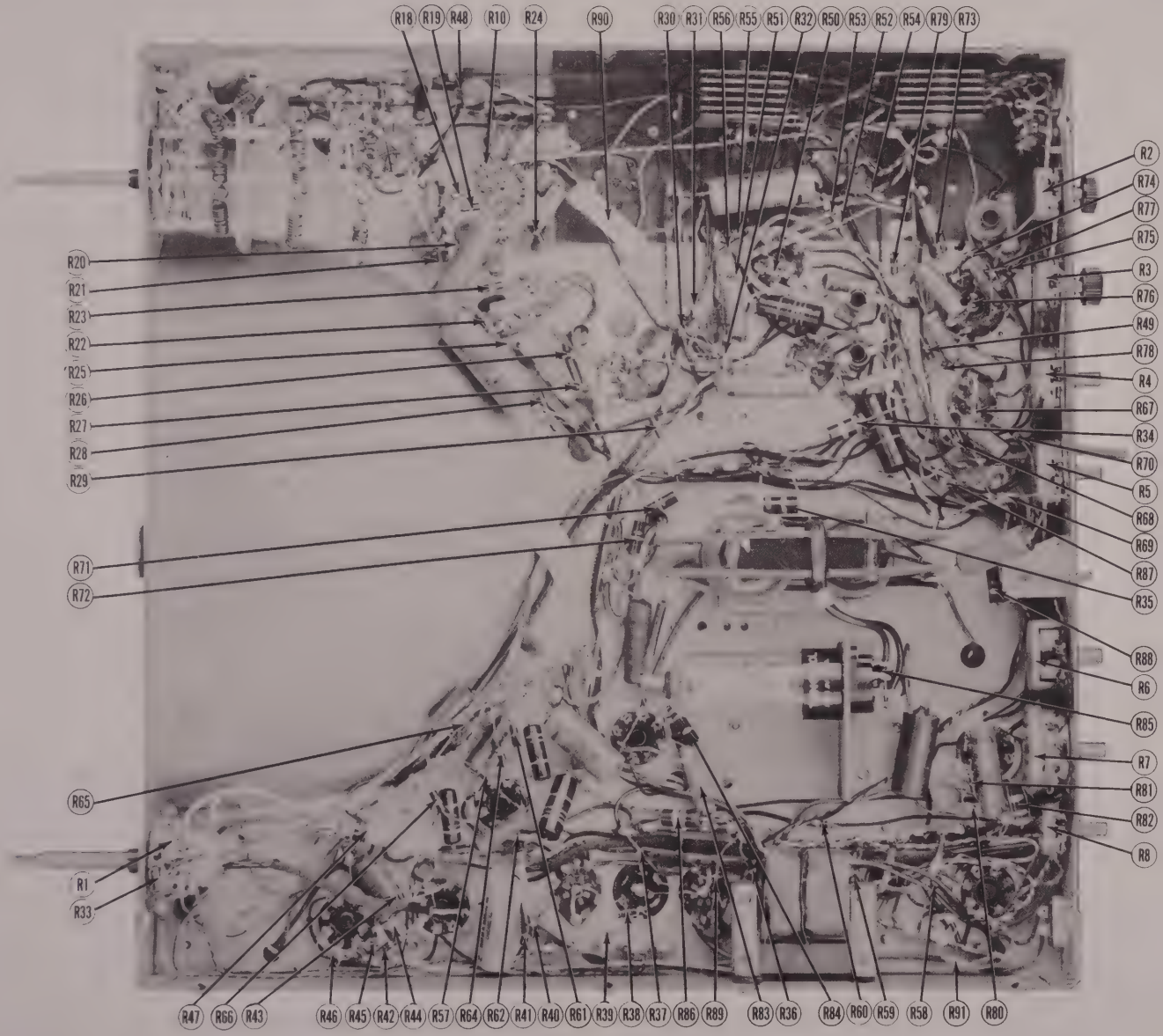
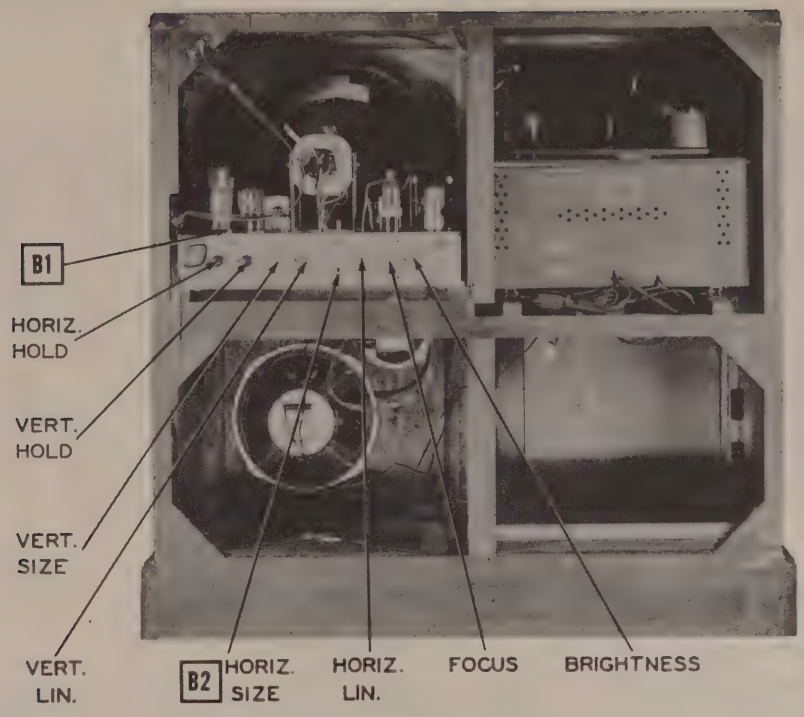
RF TUNER



CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CABINET-REAR VIEW

HORIZONTAL FREQENCY AND LINEARITY ADJUSTMENTS

Turn the set on and tune in a TV station. Turn the horizontal hold control to the mid-position of its range. Adjust the horizontal frequency slug (B1) to the center of the range over which the picture synchronizes horizontally.

Adjust the horizontal size lever (B2) until the picture fills the mask horizontally. Adjust the horizontal linearity control until picture is symmetrical from left to right.

DISASSEMBLY INSTRUCTIONS (MODEL 12VF4R)

1. Remove six push-on type control knobs from TV and radio.
2. Remove twelve screws holding rear cover of radio section. Remove cover.
3. Remove ten screws holding rear cover of TV section. Disconnect TV power plug and remove cover.
4. Loosen antenna terminal screws. Remove built-in antenna leads.
5. Remove two screws holding antenna terminal strip.
6. Remove speaker plug.
7. Remove six 1/4" hex head bolts holding TV chassis. Remove chassis.
8. Remove two screws holding AM loop antenna. (Receiver rear cover.) Pull out and remove antenna plugs. Remove cover.
9. Disconnect phono motor power plug and pick-up plug.
10. Remove speaker plugs.
11. Remove two screws holding power interlock plug.
12. Remove phillips head screw holding phono motor power plug clamp. Remove clamp.
13. Remove three 1/4" hex head bolts holding AM-FM chassis. Remove chassis. (It is necessary to turn chassis to various positions for removal.)

DISASSEMBLY INSTRUCTIONS (MODEL 10VK22)

1. Remove two push-on type control knobs.
2. Remove eight screws holding rear cover. Remove cover.
3. Remove speaker plug.
4. Loosen two antenna terminal screws. Remove built-in antenna.
5. Remove two screws holding antenna terminal strip.
6. Remove five 1/4" hex head bolts holding chassis. Remove chassis.
7. Remove four 5/16" hex nuts holding speaker. Remove speaker.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	EIA BASE TYPE	NOTES
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Converter	12AT7	12AT7	9A	
V3	1st Video IF	6AU6	6AU6	7BK	
V4	2nd Video IF	6AU6	6AU6	7BK	
V5	3rd Video IF	6AU6	6AU6	7BK	
V6	Video Amp.	6AU6	6AU6	7BK	
V7	Sound IF Amp.	6AU6	6AU6	7BK	
V8	Ratio Det.	6AL5	6AL5	6BT	
V9	AF Amp.	6J5GT	6J5GT	6Q	
V10	Audio Output	6V6GT	6V6GT	7AC	
V11	Sync. Clipper	6SN7GT	6SN7GT	8BD	
V12	Vert. Osc.	6J5GT	6J5GT	6Q	
V13	Vert. Output	6V6GT	6V6GT	7AC	
V14	Hor. Phase Det.	6AL5	6AL5	6BT	
V15	Hor. Multivibrator	6SN7GT	6SN7GT	8BD	
V16	Hor Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19A	Picture Tube	12LP4	12LP4	12D	
B	Picture Tube	10BP4	10BP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	140	150	23B484097	AFH28D		D6282	Voltage Doubler Cap.
C2A	100	300	23B790147	AFH20G124F		D14986	▪ Filter
B	60	250					■ Filter
C	20	250					▲ Decoupling
C3A	125	300	23B790148	AFH24G4F5A		D7205	▪ Filter
B	20	250		20B			■ V. Amp. Decoupling
C	20	25					▲ Output Cathode Bypass
D	100	15					Not used
C4	100	30		PRS50/100		TVA-17	Vert. Output Cathode Bypass
C5	10	50	23A90205	PRS50/10		TVA-14	Stabilizing Cap.
C6	250		21K77375	GP250M	GP2K-250		Ant. Isolation
C7	50		21K77373	GP50M	GP1K-50		RF Coupling
C8	250		21K77375	GP250M	GP2K-250		RF Coupling
C9	10000		21K482726	BPD-10	821-01	36C1	AVC Filter
C10	1500		21A470790	GP1500M	GP2L-0015	29C3	RF Cathode Bypass ♦
C11	1500		21A470790	GP1500M	GP2L-0015	29C3	RF Cathode Bypass ♦
C12	1500		21A470790	GP1500M	GP2L-0015	29C3	RF Screen Bypass ♦
C13	10000		21K482726	BPD-10	821-01	36C1	RF Plate Decoupling
C14	10000		21K482726	BPD-10	821-01	36C1	RF Plate Decoupling
C15	250		21K77375	GP250M	GP2K-250		RF Filament Bypass
C16	6		21K470324				RF Coupling
C17	2		21K478280				Osc. Coupling
C18	20		21K470322	CN20JNPO	NPOK-20		Osc. Grid Cap.
C19	2		21K478280				Osc. Feedback
C20	1500		21A470790	GP1500M	GP2L-0015	29C3	Osc. Plate Bypass ♦
C21	5000		21A470789	BPD-5	811-005	29C1	RF Bypass
C22	1500		21A470790	GP1500M	GP2L-0015	29C3	Mixer Plate Decoupling
C23	1500		21A470790	GP1500M	GP2L-0015	29C3	Mixer Cathode Bypass
C24	250		21K77375	GP250M	GP2K-250		Mixer Filament Bypass
C25	.25	100	21A470	P288-25			AGC Filter
C26	1500		21A470790	GP1500M	GP2L-0015	29C3	AGC Filter
C27	5000		21A470789	BPD-5	811-005	29C1	1st V. IF Cathode Bypass
C28	.5	200	21A4712	P288-5		TC-5	1st V. IF Decoupling
C29	5000		21A470789	BPD-5	811-005	29C1	1st V. IF Decoupling
C30	5000		21A470789	BPD-5	811-005	29C1	RF Bypass
C31	5000		21A470789	BPD-5	811-005	29C1	RF Bypass
C32	5000		21A470789	BPD-5	811-005	29C1	AGC Filter ¶
C33	.1	200	21A470	P288-1		TM-1	AGC Filter
C34	1500		21A470790	GP1500M	GP2L-0015	29C3	IF Coupling
C35	250		21K77375	GP250M	GP2K-250	1FM-325	1st V. IF Fil. Bypass
C36	5000		21A470789	BPD-5	811-005	29C1	RF Bypass
C37	1500		21A470790	GP1500M	GP2L-0015	29C3	2nd V. IF Cath. Bypass ♦
C38	1500		21A470790	GP1500M	GP2L-0015	29C3	2nd V. IF Decoupling ♦
C39	1500		21A470790	GP1500M	GP2L-0015	29C3	IF Coupling
C40	1500		21A470790	GP1500M	GP2L-0015	29C3	AGC Filter
C41	5000		21A470789	BPD-5	811-005	29C1	3rd V. IF Cath. Bypass
C42	5000		21A470789	BPD-5	811-005	29C1	3rd V. IF Decoupling
C43	5000		21A470789	BPD-5	811-005	29C1	3rd V. IF Decoupling
C44	1500		21A470790	GP1500M	GP2L-0015	29C3	3rd V. IF Fil. Bypass
C45	1500		21A470790	GP1500M	GP2L-0015	29C3	3rd V. IF Fil. Bypass
C46	.1	100	21A4716	P288-1		TM-1	Video Coupling
C47	1000		21K478410	GP1000M	GP2L-001	1FM-21	V. Amp. Cathode Bypass
C48	750		21K78344	GP750M	GP2K-750	1FM-375	V. Amp. Cathode Bypass
C49	250		21K77375	GP250M	GP2K-250	1FM-325	V. Amp. Cathode Bypass
C50	5000		21A470789	BPD-5	811-005	29C1	V. Amp. Decoupling #
C51	70		21K470328			MS-47	Fixed Trimmer
C52	.1	400	5R9674	P488-1		TM-1	Video Coupling
C53	2		21K478280				Sound IF Coupling
C54	60		21K470			MS-46	Fixed Trimmer
C55	1500		21A470790	GP1500M	GP2L-0015	29C3	Sound IF Decoupling ♦
C56	5000		21A470789	BPD-5	811-005	29C1	Sound IF Cathode Bypass
C57	5000		21A470789	BPD-5	811-005	29C1	Sound IF Decoupling
C58	500	500	21R6590	1468-0005	GP2K-500	1FM-35	Diode Load Cap.
C59	1500		21A470790	GP1500M	GP2L-0015	29C3	De-emphasis
C60	500	500	21R6590	1468-0005	GP2K-500	1FM-35	AF Grid Bypass
C61	5000		21A470789	BPD-5	811-005	29C1	Audio Coupling
C62	.01	600	8R9834	P488-.01	GP2-335-01	TM-11	Output Plate Decoupling
C63	.001	600	8R9866	P688-001	GP2L-001	TM-21	Sync. Coupling
C64	.047	600	8R9873	P488-047		TM-15	Sync. Coupling
C65	.005	600	21A470789	P688-005		TM-25	Integrator Net.
C66	.0047	600	21A470789	P688-0047	GP2M-005	TM-25	Integrator Net.
C67	.002	600	8R9867	P688-002	GP2M-002	TM-22	Vert. Sync. Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C68	.05	600	8R9873	P688-05		TM-15	Vert. Discharge
C69	.047	400	8R9873	P488-047		TM-15	Vert. Sweep Coupling
C70	.0047	600	8R9869	P688-0047	GP2M-005	TM-25	Vert. Sweep Coupling
C71	.001	600	8R9866	P688-001	GP2L-001	TM-21	Voltage Divider
C72	.002	600	8R9867	P688-002	GP2M-002	TM-22	Integrator Net.
C73	.0047	600	8R9869	P688-0047	GP2M-005	TM-25	Vert. MV Feedback
C74	1500		21A470790	GP1500M	GP2L-0015	29C3	RF Bypass
C75	20		21K470322	GP20K	NPOK-20	MS-42	1st Sync. Clipper Grid Bypass #
C76	.001	600	21K470790	P688-001	GP2L-001	TM-21	Hor. Sync. Coupling ¶
C77	.001	600	21K470790	P688-001	GP2L-001	TM-21	Hor. Sync. Coupling ¶
C78	.005	600	8R8970	P688-005	GP2M-005	TM-25	AFC Filter
C79	.001	600	8R9866	P688-001	GP2L-001	TM-21	AFC Filter
C80	.01	600	8R9870	P688-01	GP2-335-01	TM-11	AFC Filter
C81	.005	600	8R9869	P688-005	GP2M-005	TM-25	Fixed Trimmer
C82	.250		21K77375	GP250M	GP2K-250	1FM-325	Hor. MV Feedback
C83	680	500	21R2741	GP680K	GP2K-680	1FM-37	Hor. Discharge
C84	5000		21A470789	BPD-5	811-005	29C1	Hor. Sweep Coupling
C85	.1	600	8R9874	P688-1		TM-1	Hor. Output Screen Bypass
C86	.1	100	8R9806	P288-1		TM-1	Hor. Output Cathode Bypass
C87	.1	600	8R9874	P688-1		TM-1	Damper Filter
C88	.05	600	8R9819	P688-05		TM-15	Linearity Cap.
C89	.02	600	8R9872	P688-02		TM-12	Hor. Sweep Coupling
C90	5000		21A470789	1467-005	811-005	29C1	RF Bypass #

♦ Some models use 5000MMF in this application.
¶ Some models use 1500MMF in this application.
# Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	2000Ω		18A790166			Contrast control, tapped at 1000Ω and 1500Ω
B	1 Meg.					Volume control and switch
R2	100KΩ		18A791574	Q11-128	M-49-S	Horiz. hold control-See note 1
R3	1 Meg.		18A90147	Q11-137	M-61-S	Vert. hold control
R4	5 Meg.		18A90145	Q11-141	M-85-S	Height control
R5	5000Ω		18A791132	Q11-114	M-19-S	Vert. linearity control
R6	2000Ω	2	18A790146	W-2000	43-2000	Horiz. linearity control-Wire Wound
R7	2000Ω	4	18A790162		10-2000	Focus control, Wire Wound
R8	1 Meg.		18A90147	Q11-137	M-61-S	Brightness control

Note 1. Some models use 50KΩ control, Part No. 18A790167, in this application.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R9	33KΩ	1	6R6410	BTS-33K	RF Choke Shunt
R10	1 Meg. 20%	1	6R6046	BTS-1 Meg.	Bias Network
R11	82Ω	1	6R2035		RF Cathode
R12	3900Ω	1	6R5659	BTS-3900	RF Plate Decoupling
R13	1000Ω	1	6R6229	BTS-1000	RF Screen Decoupling
R14	33KΩ	1	6R6410	BTS-33K	Conv. Grid
R15	1200Ω	1	6R6393	BTS-1200	Conv. Cathode
R16	10KΩ	1	6R6320		Osc. Grid
R17	1000Ω	1	6R6229	BTS-1000	Osc. Plate Decoupling
R18	5600Ω	1	6R6117	BTS-5600	1st Video IF Transformer Shunt
R19	82Ω	1	6R2035		1st Video IF Cathode
R20	220Ω	1	6R6270		1st Video IF Decoupling
R21	4.7 Meg.	1	6R6446	BTS-4.7 Meg.	Voltage Divider
R22	3.9 Meg.	1	6R490110	BTS-3.9 Meg.	Voltage Divider
R23	22KΩ	1	6R6397		2nd Video IF Grid
R24	82Ω	1	6R2035		2nd Video IF Cathode
R25	220Ω	1	6R6270		2nd Video IF Decoupling
R26	3900Ω	1	6R5659	BTS-3900	3rd Video IF Coil Shunt
R27	82Ω	1	6R2035		3rd Video IF Cathode
R28	220Ω	1	6R6270		3rd Video IF Cathode
R29	220Ω	1	6R6270		3rd Video IF Decoupling
R30	100KΩ	1	6R6031	BTS-100K	Voltage Divider
R31	1.5 Meg.	1	6R6460	BTS-1.5 Meg.	Bias Network
R32	1 Meg. 20%	1	6R6046	BTS-1 Meg.	Video Amp. Grid
R33	180Ω	1	6R5660	BW-½-180	Voltage Divider
R34	6800Ω	2	6R5690	BT-2-6800	Video Amp. Plate
R35	4700Ω	2	6R5671	BT-2-4700	Video Amp. Decoupling
R36	150Ω	1	6R6373		Sound IF Cathode
R37	1000Ω	1	6R6229	BTS-1000	Sound IF Decoupling
R38	220Ω	1	6R6270		Balancing
R39	33KΩ	1	6R6410	BTS-33K	De-emphasis
R40	6800Ω	1	6R6428	BTS-6800	Ratio Det. Diode Load
R41	6800Ω	1	6R6428	BTS-6800	Ratio Det. Diode Load
R42	1000Ω	1	6R6229	BTS-1000	AF Cathode
R43	470KΩ	1	6R6377	BTS-470K	AF Plate
R44	100KΩ	1	6R6328	BTA-100K	Voltage Divider-See Note 6
R45	470KΩ	1	6R6377	BTS-470K	Output Grid
R46	330Ω			BW-½-330	Output Cathode-See Note 2
R47	1000Ω	2	6R3922	BT-2-1000	Decoupling
R48	1000Ω		6R6229	BTS-1000	Decoupling
R49	10KΩ		6R6320	BTS-10K	Isolation
R50	1 Meg. 20%		6R6046	BTS-1 Meg.	Sync. Clipper Grid
R51	1 Meg. 20%		6R6046	BTS-1 Meg.	Sync. Clipper Plate
R52	22KΩ		6R6397	BTS-22K	Sync. Clipper Grid
R53	1000Ω		6R6229	BTS-1000	Sync. Clipper Cathode
R54	2200Ω		6R6069	BTS-2200	Sync. Clipper Cathode
R55	5600Ω		6R6117	BTS-5600	Sync. Clipper Plate
R56	22KΩ		6R6397	BTS-22K	Integrator
R57	8200Ω		6R2004	BTS-8200	Integrator
R58	680KΩ			BTS-680K	Vert. Osc. Grid
R59	470KΩ		6R6377	BTS-470K	Vert. Osc. Plate

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R60	8200Ω	½	6R2004	BTS-8200	Vert. Peaking
R61	10 Meg. 20%	½		BTS-10 Meg.	Vert. Output Grid-See Note 3
R62	470Ω	½	6R6090	BTS-470	Vert. Output Cathode
R63	150KΩ	½	6R6398	BTS-150K	Voltage Divider-See Note 4
R64	100KΩ	½	6R6031	BTS-100K	Voltage Divider
R65	100KΩ	½	6R6031	BTS-100K	Voltage Divider
R66	22KΩ	½	6R6397	BTS-22K	Integrator Network
R67	100KΩ	½	6R6031	BTS-100K	Horiz. Phase Det. Load
R68	100KΩ	½	6R6031	BTS-100K	Horiz. Phase Det. Load
R69	4.7 Meg.	½	6R6446	BTS-4.7 Meg.	Horiz. Phase Det. Load
R70	15KΩ	½	6R6477	BTS-15K	Feedback Network
R71	150KΩ 5%	1	6R5721	BTA-150K-5%	Feedback Network
R72	150KΩ 5%	1	6R5721	BTA-150K-5%	Feedback Network
R73	4.7 Meg.	½	6R6446	BTS-4.7 Meg.	Horiz. AFC Filter Network
R74	6800Ω	½	6R6428	BTS-6800	Horiz. MV Plate
R75	1000Ω	½	6R6229	BTS-1000	Horiz. MV Cathode
R76	470Ω	½	6R6090	BTS-470	Horiz. MV Cathode
R77	100KΩ	½	6R6031	BTS-100K	Horiz. MV Grid
R78	120KΩ	½		BTS-120K	Horiz. MV Plate-See Note 5
R79	1500Ω	½	6R6038	BTS-1500	Horiz. Peaking
R80	470KΩ	½	6R6377	BTS-470K	Horiz. Output Grid
R81	47Ω	½	6R5550	BW-½-47	Horiz. Output Cathode
R82	6800Ω	2	6R5690	BT-2-6800	Horiz. Output Screen
R83	1000Ω	2	6R3922	BT-2-1000	Damper Filter
R84	470Ω	1		BTA-470	Damper Filter-See Note 4
R85	3.3Ω	½	17K485412		HV Rect. Filament
R86	10KΩ	2	HV0009	BT-2-10K	Focus Coil Shunt
R87	47KΩ	½	6R6048	BTS-47K	Voltage Divider
R88	10KΩ	1	6R6320	BTA-10K	Horiz. Size Coil Shunt
R89	1000Ω	½	6R6229	BTS-1000	Voltage Equalizer
R90	7.5Ω	3	17A791166		Surge Limiter-Wire Wound
R91	470KΩ	½	6R6377	BTS-470K	Isolation

Note 2. Some models use 220Ω resistor in this application.
Note 3. Some models use 2.2 Meg. resistor in this application.
Note 4. Not used in all models.
Note 5. Some models use 150KΩ resistor in this application.
Note 6. Used in chassis TS-14 and TS-23 only.

TRANSFORMER (FILAMENT)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC	6.3VAC @ .49A	6.3VAC @ 7.2A	6.3VAC @ .6A	25B790141			
T2	117VAC	6.3VAC @ 1.2A			25B790140	P-6134 ①	P-2945 ①	F-633 ①

① Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T3	168Ω		24B790055				Hor. Osc. Coil
T4	215Ω	SEC. 1	24C790184				Hor. Output Trans.
	Tap @	0Ω					
	48Ω	SEC. 2					
		0Ω					
T5	770Ω	9.8Ω	25C790151	A-8112	A-3035 ①	TSO-5	Vert. Output Trans.
T6A	62Ω		24C780542				Hor. Deflection Coil
B	63Ω						Vert. Deflection Coil
T7	2200Ω		7K780176				Focus Coil

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T8	5.3KΩ	8Ω	305Ω	.3Ω	25B790686	A-3856	A-2900	RO-9 ②	② Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1A	100Ω	4Ω	50C790154 ④		5E100S	④ Used in table models.
B	100Ω	4Ω	50C791118 ⑤			⑤ Used in console models.
	CONE DIA.	V. C. DIA.				
SP2A	4 3/8"	9/16"	④			
B	8"		⑤			

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

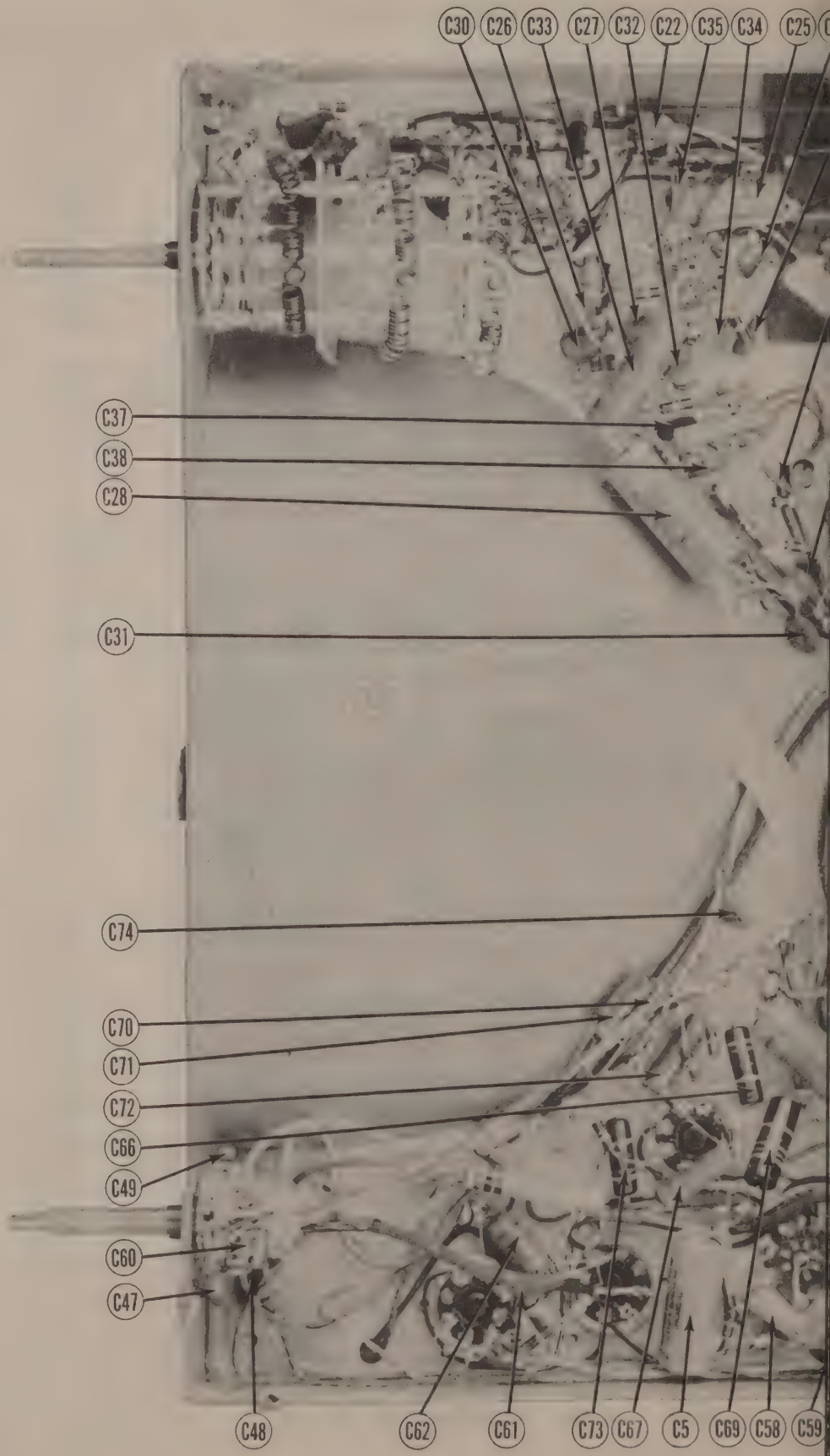
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L1	Ant. Input Trans.	0Ω		24A790033		
L2	Ant. Coils	0Ω		24C790535		Part of tuner.
L3	RF Choke	8Ω		24K791446		10 microhenries
L4	RF Coils	0Ω		24K790536		Part of tuner.
L5	RF Coil	0Ω		24K790607		Channel #13
L6	Osc. Coils	0Ω		24K790537		Part of tuner.
L7	Osc. Coil	0Ω		24K790606		Channel #13
L8	RF Choke	2.5Ω		24K780128		2 microhenries
L9	1st Video IF	.3Ω	.2Ω	24K791134		Less tuning cores.
L10	RF Choke	4.5Ω		24K790035		5.6 microhenries
L11	2nd Video IF	.2Ω		24K791433		Less tuning core and clip.
L12	RF Choke	4.5Ω		24K790035		5.6 microhenries
L13	3rd Video IF	.2Ω		24K791433		Less tuning core and clip.
L14	4.5MC Trap	1Ω		24A470159		Less tuning core and clip.
L15	Peaking	9Ω		24A790579		Wound on 18KΩ resistor , green dot.
L16	Peaking	10Ω		24A790594		Yellow dot.
L17	Sound IF	1Ω		24A470159		Less core and clip.
L18	Ratio Det. Trans.	3Ω	.5Ω	24B790125		Includes cores and clips but less shield.
L19	Width. Cont.	24Ω		24B791170		Complete with core and clip.
L20	Fil. Choke	.2Ω		24K790145		.47 microhenries
L21	Fil. Choke	.2Ω		24K790145		.47 microhenries
L22	Fil. Choke	.2Ω		24K790145		.47 microhenries
L23	Fil. Choke	.2Ω		24K790145		.47 microhenries
L24	RF Choke	.2Ω		24K790145		.47 microhenries

SELENIUM RECTIFIER

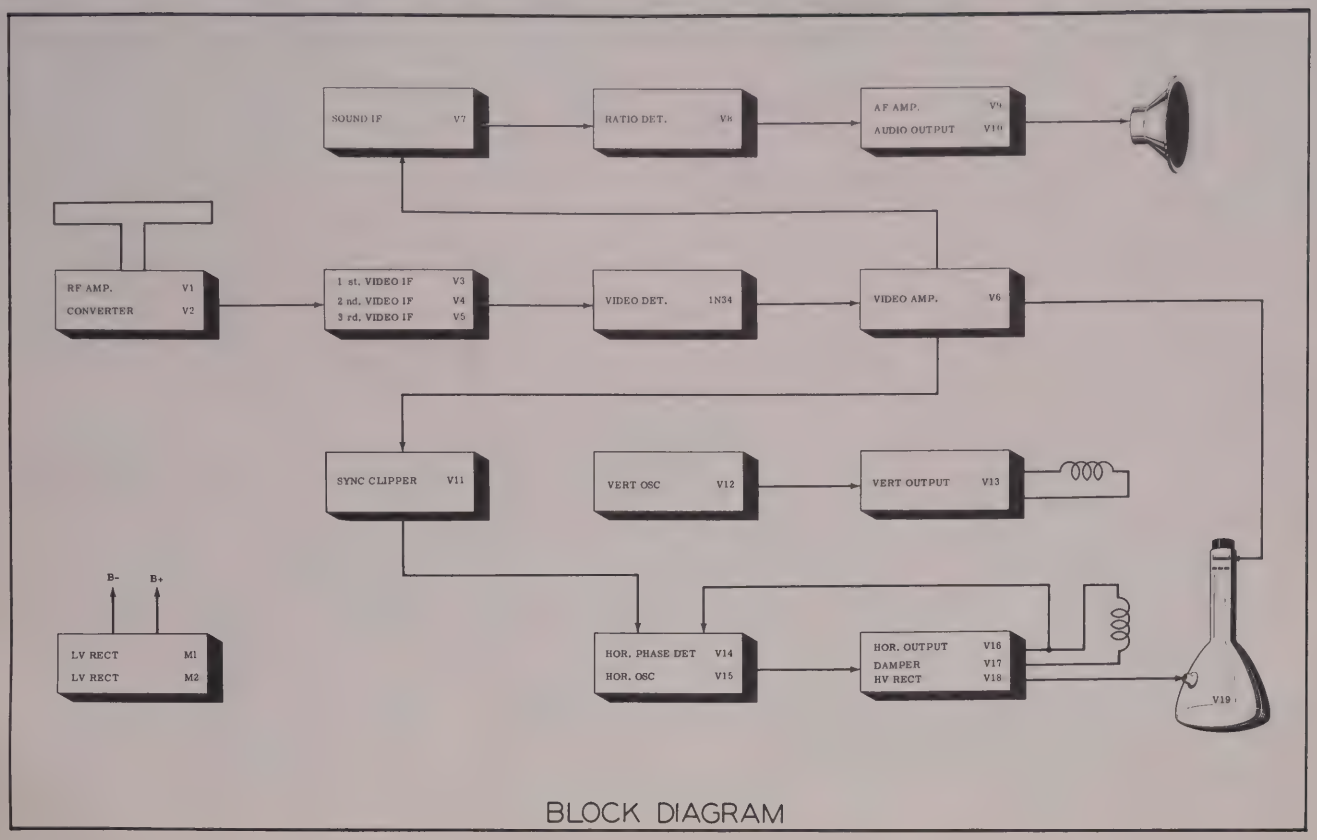
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	MOTOROLA PART No.	SYLVANIA PART No.		
M1	.225A	48B780584	NF-5		
M2	.225A	48B780584	NF-5		

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	RF Tuner	1X780177	Channel selector switch, fine tuning, trimmer and coils assy.
M4A	4th Video IF	24A790175	Less core and clip.
B	RF Choke	24K791446	10 microhenries
C	RF Choke	24B790129	
D	Video Coupling	21K478234	8MMF
E	Video Det. Filter		6MMF } Video Detector Panel Assembly
F	RF Bypass	21A470790	1500MMF
G	Video Det. Load	6R2004	8.2KΩ
H	Video Detector	48A90173	1N34
M5	Ion Trap	24B484822	Permanent magnet type
	Core	46K480256	Iron and screw (L9 secondary)
	Core	46A470310	Iron and screw (L9 primary and L17)
	Core	46A70023	Iron and screw (L18 primary)
	Core	46A470302	Iron and screw (L18 secondary)
	Core	46K471143	Iron and screw (T3)
	Core	46A791119	With slide adjustment (L19)
	Corona Shield	1X780182	V18
	Socket	9A790685	Picture tube (octal)
	Cabinet	16F790486	Model 10VT10, Brown mahogany table model
	Cabinet	16K790487	Model 10VT10R, red mahogany table model.
	Cabinet	16F790601	Model 10VK12, brown mahogany consolette
	Cabinet	16K790595	Model 10VK12R, red mahogany consolette
	Cabinet	16E791045	Model 12VT13, brown mahogany table models.
	Cabinet	16K791047	Model 12VT13B limed oak table model.
	Cabinet	16K791046	Model 12VT13R, red mahogany table model.
	Cabinet	16F790664	Model 12VK11 Brown mahogany consolette
	Cabinet	16K790666	Model 12VK11B, limed oak consolette
	Cabinet	16K790665	Model 12VK11R, red mahogany consolette
	Safety Glass	61C790408	Models 10VT10, 10VT10R, 10VK12, 10VK12R
	Safety Glass	61K790653	Models 12VT13, 12VT13B, 12VT13R, 12VK11, 12VK11B, 12VK11R
	Safety Glass	13D790718	Models 12VT13, 12VT13B, 12VT13R
	Knob	36B790506	Channel selector, all models.
	Knob	36B790505	Contrast all models
	Knob	36K790621	Off-volume, fine tuning, models 10VT10, 10CK12, 12VT13, 12VK11
	Knob	36A790507	Off-volume, fine tuning, models 10VT10R, 10VK12R, 12VT13R, 12VK11R



CHASSIS BOTTOM VIEW-C



BLOCK DIAGRAM

PHOTOFACT* Folder

PHILCO MODELS
49-1040, 49-1076, 49-1150, 49-1178, 49-1240, 49-1278

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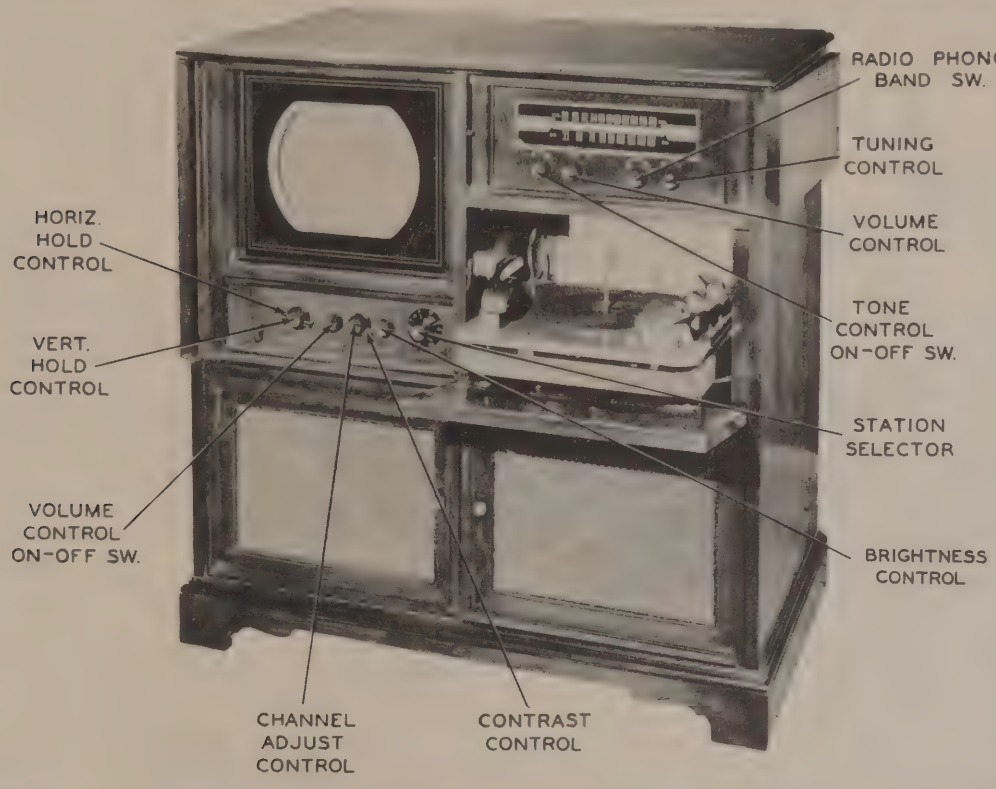
DATE 4-50 SET 92 FOLDER 5

PHOTOFACT* Folder
*TRADE MARK

PHILCO MODELS 49-1040, 49-1076, 49-1077 49-1150, 49-1175, 49-1240, 49-1278, 49-1279 49-1280



PHILCO MODELS 49-1040, 49-1076, 49-1077, 49-1150, 49-1175, 49-1240, 49-1278, 49-1279, 49-1280

TRADE NAME	Philco Models, 49-1040 (Code 123), 49-1076 (Code 123), 49-1077 (Code 122), 49-1150 (Code 122 & 124), 49-1175 (Code 122 & 124), 49-1240 (Code 124), 49-1278 (Code 123), 49-1279 (Code 122), 49-1280 (Code 121)
MANUFACTURER	Philco Corp., Tioga and "C" Sts., Philadelphia, Pa.
TYPE SET	TV-AM-FM-Phono Combination Receiver (Some Models "TV" Only).
TUBES	Thirty Three(Combination Receivers) Twenty Six ("TV Only" Receivers)
POWER SUPPLY	110-120 Volts AC-60 Cycle
TUNING RANGE	TV Channels 2 thru 13, FM 88 - 108MC, AM 540 - 1620KC
RATING	2 Amp. ⓐ 117 Volts AC (TV), .46 Amp. ⓐ 117 Volts AC (Radio)

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FOR SERVICE INFORMATION ON RECORD CHANGER UNIT, SEE PHILCO MODEL M-9C PHOTOFACT SET #74 FOLDER #7 OR RECORD CHANGER MANUAL CM-2.

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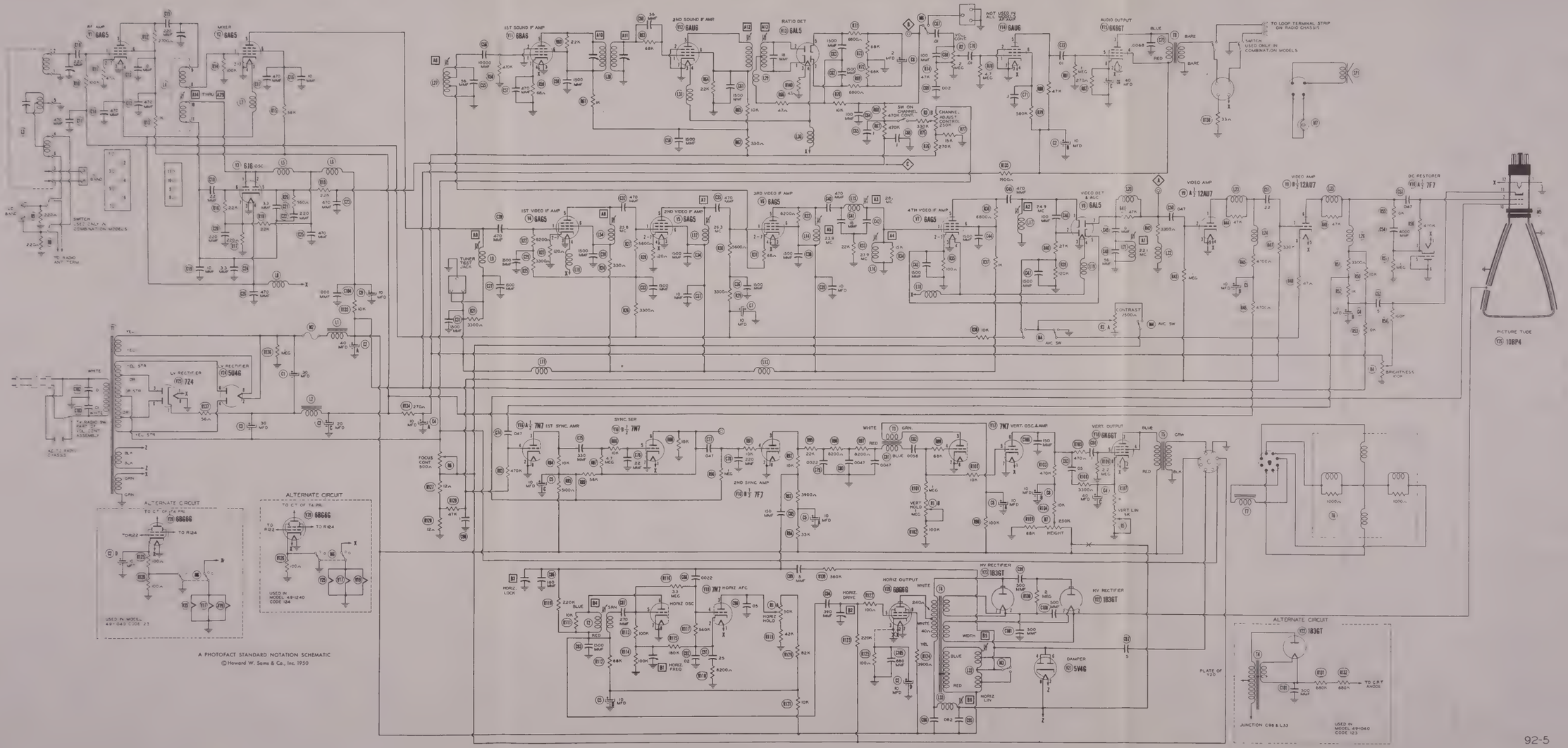
RF AMP V1 6AG5
MIXER V2 6AG5
OSC V3 6J6
1ST SOUND IF AMP V11 6BA6
2ND SOUND IF AMP V12 6AU6
RATIO DET V13 6AL5
AUDIO AMP V14 6AU6
AUDIO OUTPUT V15 6K6GT
1ST VIDEO IF AMP V4 6AG5
2ND VIDEO IF AMP V5 6AG5
3RD VIDEO IF AMP V6 6AG5
4TH VIDEO IF AMP V7 6AG5
VIDEO DET & AGC V8 6AL5
VIDEO AMP V9 A 12AU7
VIDEO AMP V10 B 12AU7
DC RESTORER V16 A 7F7
PICTURE TUBE V18 10BP4
1ST SYNC AMP V16 A 7N7
SYNC SEP V16 B 7N7
2ND SYNC AMP V10 B 7F7
VERT. OSC. & AMP V17 7N7
VERT. OUTPUT V19 6K6GT
HORIZ AFC V19 7N7
HORIZ OSC
HORIZ OUTPUT V20 6BG6G
HV RECTIFIER V22 1B3GT
HV RECTIFIER V21 1B3GT
DAMPER V21 5V4G
LV RECTIFIER V23 5U4G
LV RECTIFIER V25 724
ALTERNATE CIRCUIT
V29 6BG6G
USED IN MODEL 49-1240 CODE 124
USED IN MODEL 49-1043 CODE 23
ALTERNATE CIRCUIT
V22 1B3GT
USED IN MODEL 49-1040 CODE 123
SWITCH USED ONLY IN COMBINATION MODELS
TO LOOP TERMINAL STRIP ON RADIO CHASSIS
SWITCH USED ONLY IN COMBINATION MODELS
TUNER TEST JACK
FOCUS CONT 500Ω
CONTRAST 250Ω
BRIGHTNESS 100K
VERT. HOLD MEG
VERT. LIN 5K
HEIGHT 250K
WIDTH
HORIZ LIN.
HORIZ LOCK
HORIZ DRIVE
HORIZ HOLD 50K
HORIZ FREQ
CHANNEL ADJUST 470K CONT.
SW ON 470K CONT.
AVC SW
PLATE OF V20
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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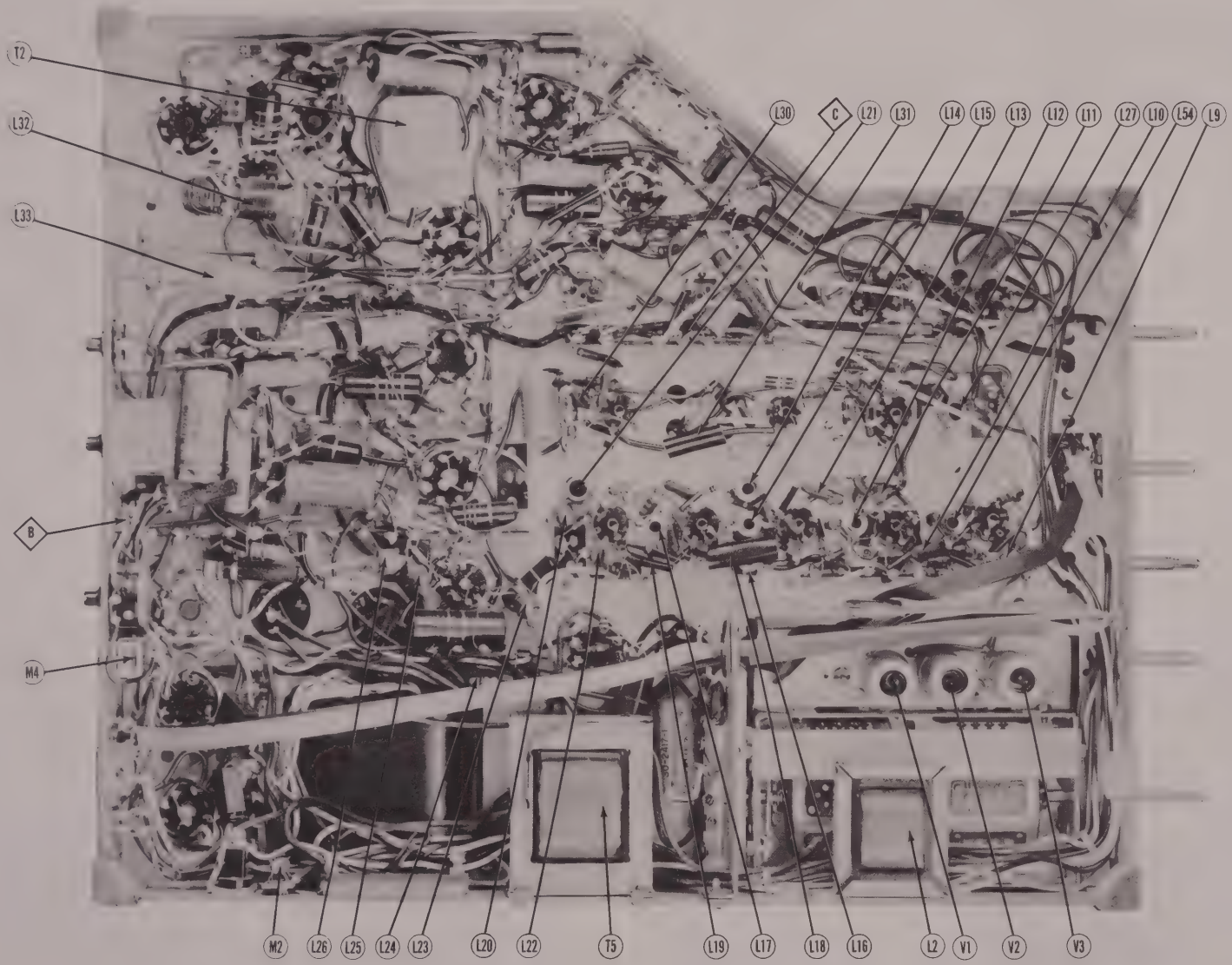
PHILCO MODELS 49-1040, 49-1076, 49-1077, 49-1150, 49-1175, 49-1240, 49-1278, 49-1279, 49-1280

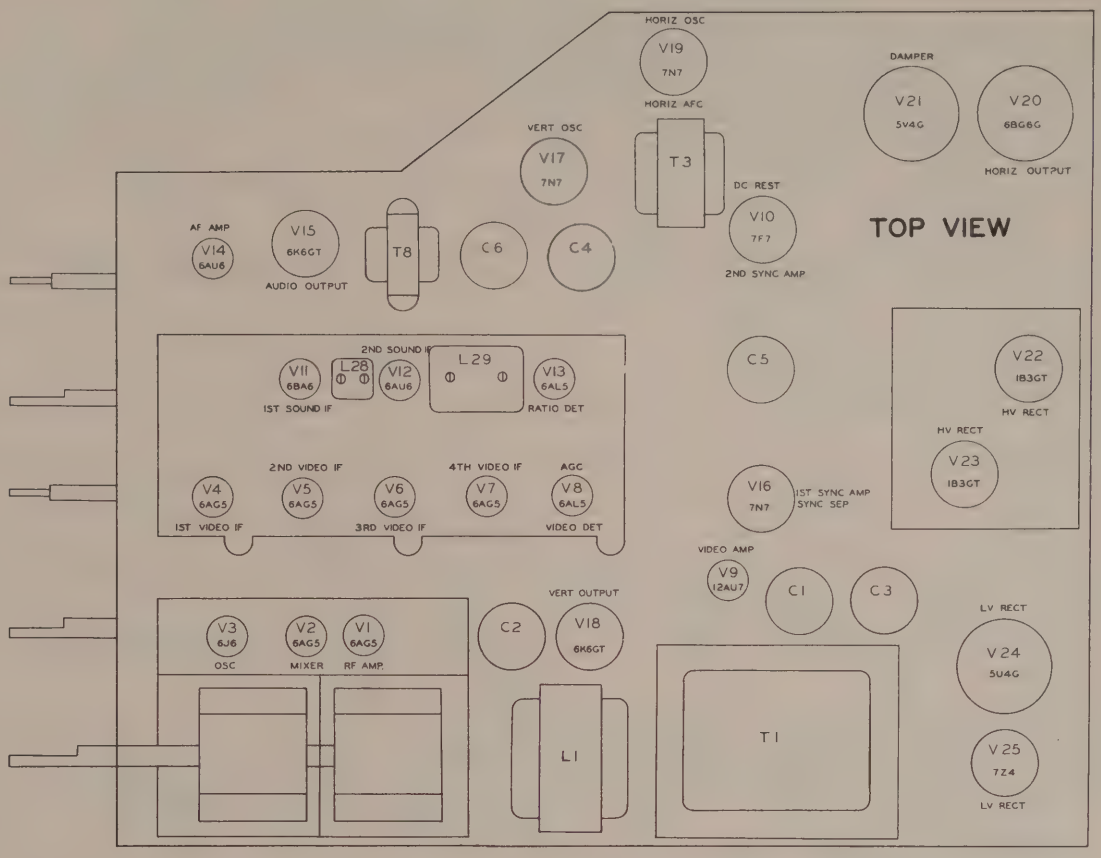
92-5

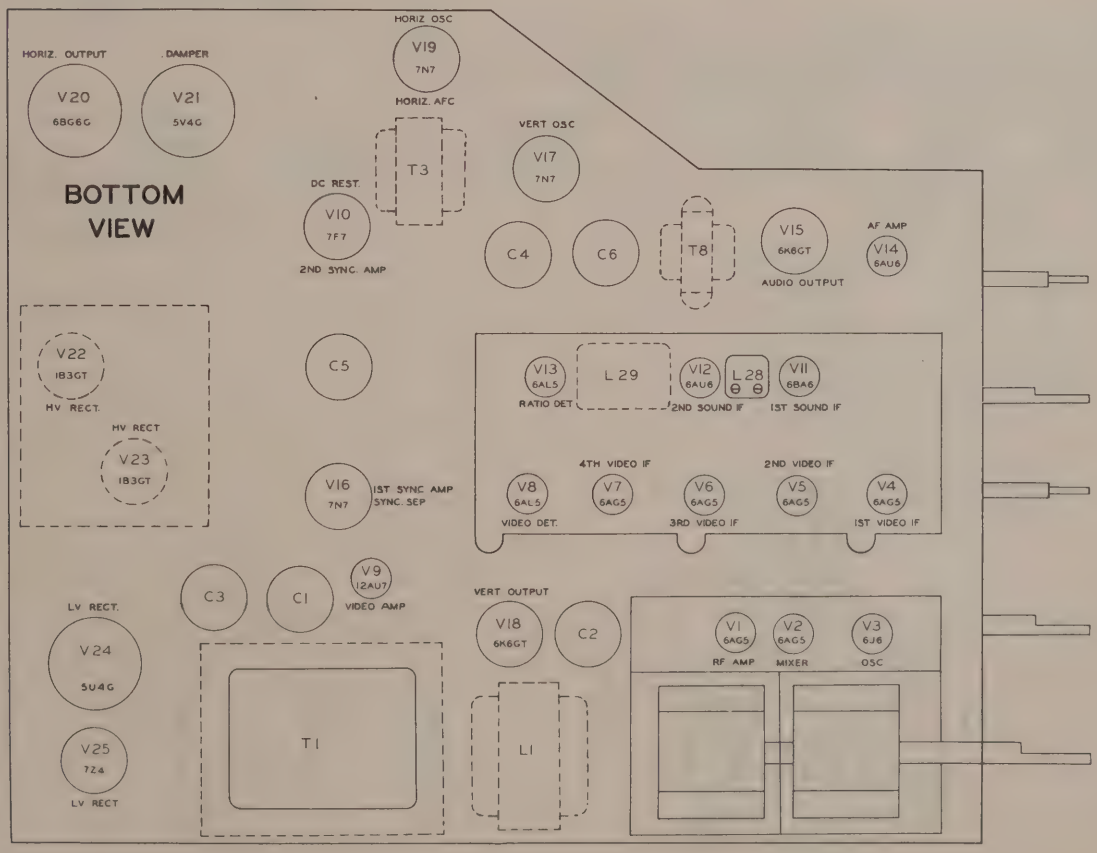
TV CHASSIS TOP VIEW

PHILCO MODELS 49-1040, 49-1076, 49-1077, 49-1150, 49-1175, 49-1240, 49-1278, 49-1279, 49-1280



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Turn the AVC switch to the "off" position and set the contrast control at approximately 3/4 of its rotation in the clockwise direction.
Pull the horizontal oscillator tube (7N7-V19) to eliminate the high voltage shock hazard during the alignment procedure.

VIDEO IF ALIGNMENT

Remove the oscillator tube (6J6-V3) and remove the oscillator clip coil of any channel from the turret and switch the tuner to that channel.
Use an ungrounded tube shield over the mixer tube as a means of injecting the signal.
Attenuate the signal generator so as not to exceed 2 volts on the VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.		High side to ungrounded tube shield over mixer tube (V2). Low side to chassis.	22.1MC (Unmod.)	Any	DC Probe to Point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.		"	24.9MC (Unmod.)	"	"	A2	Adjust for maximum deflection.
3.		"	28.1MC (Unmod.)	"	"	A3	Adjust for MINIMUM deflection.
4.		"	23.9MC (Unmod.)	"	"	A4, A5	Adjust for maximum deflection.
5.		"	22.1MC (Unmod.)	"	"	A6	Adjust for MINIMUM deflection.
6.		"	26.3MC (Unmod.)	"	"	A7	Adjust for maximum deflection.
7.		"	25.8MC (Unmod.)	"	"	A8	Adjust for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.		High side to ungrounded tube shield over mixer tube (V2). Low side to chassis.	25MC (10MC SWP)	22.1MC 26.6MC 28.1MC	Any	Vert. Amp. thru 10KΩ resistor to Point (A). Low side to chassis.	A1, A2, A3, A4, A5, A6, A7, A8, A9	Adjust for pattern and placement of markers as per Fig 1.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.		High side to ungrounded tube shield over mixer tube (V2). Low side to chassis.	22.1MC (1MC SWP)	22.1MC	Any	Vert. Amp. thru 10KΩ resistor to Point (B). Low side to chassis.	A10, A11	Adjust for maximum indications.
10.		"	"	"	"	"	A12, A13	Adjust A12 for maximum amplitude and straightness of diagonal line going from peak to peak. Adjust A13 so 22.1MC marker is located at center of diagonal line as per Fig 2. Replace oscillator tube (V3).

OSCILLATOR ALIGNMENT

The oscillator alignment should not be attempted until the sound IF channel has been accurately aligned.
Disable the AFC system during the oscillator alignment by temporarily grounding Point (C).
The oscillator coil slug adjustments are available through the hole in the front panel of the chassis. As each channel is switched in, the oscillator coil slug for that channel is in line with the hole in front of the chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	Two 125Ω carbon res.	Across high band antenna terminals with 125Ω resistor in each generator lead.	215.75MC	13	DC Probe to Point (B). Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
12.	"	"	209.75MC	12	"	A15	"
			203.75MC	11		A16	
			197.75MC	10		A17	
			191.75MC	9		A18	
			185.75MC	8		A19	
			179.75MC	7		A20	
13.	"	Across low band antenna terminals with 125Ω resistor in each generator lead.	87.75MC	6	"	A21	"
			81.75MC	5		A22	
			71.75MC	4		A23	
			65.75MC	3		A24	
			59.75MC	2		A25	

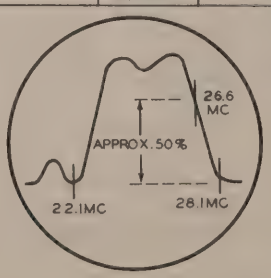


FIG. 1

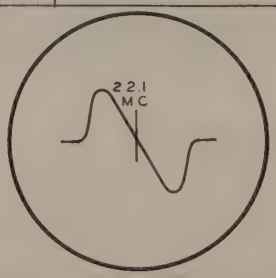


FIG. 2

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If alignment is to be done on both FM and AM bands, the AM alignment should be done first.
Use isolation transformer if available. If not connect a .1mfd capacitor in series with low side of signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to output reading. Use an insulated alignment screwdriver for adjusting.
The calibration points should be marked by pencil on the dial backplate when the receiver is removed from the cabinet. The reference point from which the measurements are made is the left hand edge of the dial backplate. Pointer setting with tuning gang closed 3 11/16", 1500KC - 9 1/16", 1600KC - 9 7/16", 92MC - 5 5/16", and 105MC - 8 7/16".

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
14.	.1MFD	High side to terminal #1 of AM antenna terminal strip. Low side to B-.	455KC	AM	540KC	Across terminals #2 and #3 on AM antenna terminal strip.	A26, A27, A28, A29, A30, A31	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation. Do not repeat adjustments.
15.		Loop	1600KC	"	1600KC	"	A32	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
16.		"	1500KC	"	1500KC	"	A33	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K resistor (±5%) in series from pin 2 of 19T8 (V32) to chassis. The junction of these resistors is alignment point E as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
17.	.1MFD	High side to pin 1 (grid) of 6BJ6 (V30). Low side to B-.	9.1MC (Unmod)	FM	88MC	DC probe to point D . Common to B-.	A34, A35, A36	Adjust for maximum deflection.
18.	"	High side to pin 8 (grid) of 14F8 (V28). Low side to B-.	"	"	"	"	A37, A38	"
19.	"	"	"	"	"	DC probe to point E . Common to point F .	A39	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
17.	.1MFD	High side to pin (grid) of 6BJ6 (V30). Low side to B-.	9.1MC (450KC Swp)	FM	88MC	Vert. Amp. to point D . Low side to B-.	A34, A35, A36	Disconnect stabilizer cap. (C109). Adjust for maximum amplitude and symmetry as per Fig. 3.
18.	"	High side to pin 8 (grid) of 14F8 (V28). Low side to B-.	"	"	"	"	A37, A38	"
19.	"	"	"	"	"	Vert. Amp. to point F . Low side to B-.	A39	Reconnect stabilizer cap. (C109). Adjust so crossover point occurs at center of pattern as per Fig. 4. SLIGHTLY retouch A34 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
20.	Two 125Ω Carbon Resistors	Across pins 1 and 4 of FM antenna socket with 125Ω resistor in each generator lead.	105MC	FM	105MC	DC probe to point D . Common to B-.	A40	Adjust for maximum deflection.
21.	"	"	"	"	"	"	A41, A42	Rock tuning gang and adjust for maximum deflection.
22.	"	"	92MC	"	92MC	"	L40, L37, L35	Expand or compress the coil turns, whichever is necessary, until the insertion of either end of a tuning wand will cause a decrease in the VTVM reading. Repeat steps 20, 21 and 22 until no further improvement can be made.

FIG. 3

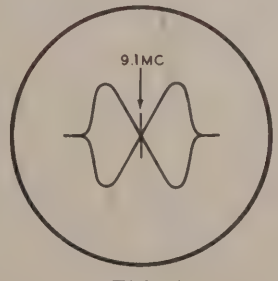


FIG. 4

PHILCO MODELS 49-1040, 49-1076, 49-1077, 49-1150, 49-1175, 49-1240, 49-1278, 49-1279, 49-1280

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-2.3VDC	.6VDC	0V.	6.3VAC	160VDC	150VDC	.6VDC		
V 2	6AG5	-3VDC	0V.	6.3VAC	0V.	135VDC	80VDC	0V.		
V 3	6J6	125VDC	125VDC	0V.	6.3VAC	§-10VDC	0V.	3.5VDC		
V 4	6AG5	-3VDC	1.1VDC	0V.	6.3VAC	130VDC	130VDC	1.1VDC		
V 5	6AG5	-.2VDC	1.2VDC	0V.	6.3VAC	135VDC	135VDC	1.2VDC		
V 6	6AG5	-.2VDC	1.1VDC	0V.	6.3VAC	135VDC	135VDC	1.1VDC		
V 7	6AG5	0V.	1.2VDC	0V.	6.3VAC	80VDC	125VDC	1.2VDC		
V 8	6AL5	0V.	-.3VDC	0V.	6.3VAC	1.1VDC	0V.	-.2VDC		
V 9	12AU7	125VDC	-.9VDC	0V.	6.3VAC	6.3VAC	280VDC	-1.5VDC	8.7VDC	0V.
V 10	7F7	6.3VAC	0V.	135VDC	1VDC	0V.	0V.	.7VDC	0V.	
V 11	6BA6	0V.	0V.	0V.	6.3VAC	110VDC	110VDC	1.3VDC		
V 12	6AU6	-.4VDC	0V.	0V.	6.3VAC	65VDC	65VDC	0V.		
V 13	6AL5	-1.9VDC	-1.9VDC	1.2VAC	6.3VAC	0V.	0V.	-2VDC		
V 14	6AU6	-.4VDC	0V.	0V.	6.3VAC	185VDC	50VDC	0V.		
V 15	6K6GT	0V.	6.3VAC	210VDC	230VDC	0V.	0V.	0V.	11VDC	
V 16	7N7	6.3VAC	0V.	160VDC	-1.1VDC	-.5VDC	29VDC	0V.	0V.	
V 17	7N7	6.3VAC	0V.	310VDC	-75VDC	-80VDC	40VDC 210VDC	0V.	0V.	
V 18	6K6GT	0V.	0V.	320VDC	320VDC	0V.	6.3VAC	6.3VAC	26VDC 32VDC	
V 19	7N7	6.3VAC	-14VDC	40VDC	-2.3VDC	-39VDC	160VDC	0V.	0V.	
V 20	6BG6G	0V.	6.3VAC	0V.	-12VDC	-12VDC	320VDC	0V.	290VDC	TOP CAP
V 21	5V4G	0V.	380VDC	0V.	330VDC	0V.	330VDC	0V.	380VDC	
V 22	1B3GT	• DO NOT MEASURE.								
V 23	1B3GT	• DO NOT MEASURE.								
V 24	5U4G	0V.	350VDC	0V.	350VAC	0V.	350VAC	0V.	350VDC	
V 25	7Z4	6.3VAC	0V.	210VAC	0V.	0V.	210VAC	170VDC	0V.	
V 26	10BP4	0V.	.3VDC	PIN 10 250VDC	PIN 11 130VDC	PIN 12 6.3VAC				
† V 27	12AU6	.4VDC	2.6VDC	43VAC	55VAC	200VDC	150VDC	3.8VDC		
† V 28	14F8	§-1VDC	31VAC	80VDC	1.8VDC	5VDC	115VDC	18VDC	1.7VDC	
V 29	12AU7	55VDC	§-2VDC	1.8VDC	31VAC	43VAC	120VDC	4.5VDC	6.2VDC	37VAC
V 30	6BJ6	-.1VDC	2.2VDC	55VAC	62VAC	140VDC	140VDC	1.8VDC		
V31	6BJ6	0V.	1VDC	62VAC	69VAC	190VDC	110VDC	0V.		
V32	19T8	-.5VDC	-1.2VDC	-.5VDC	0V.	18VAC	-.6VDC	0V.	-.8VDC	67VDC
† V32	19T8	-.5VDC	-1.2VDC	-.5VDC	0V.	18VAC	-.6VDC	0V.	-.8VDC	67VDC
V33	50C6G	0V.	117VAC	190VDC	150VDC	0V.	0V.	69VAC	15VDC	

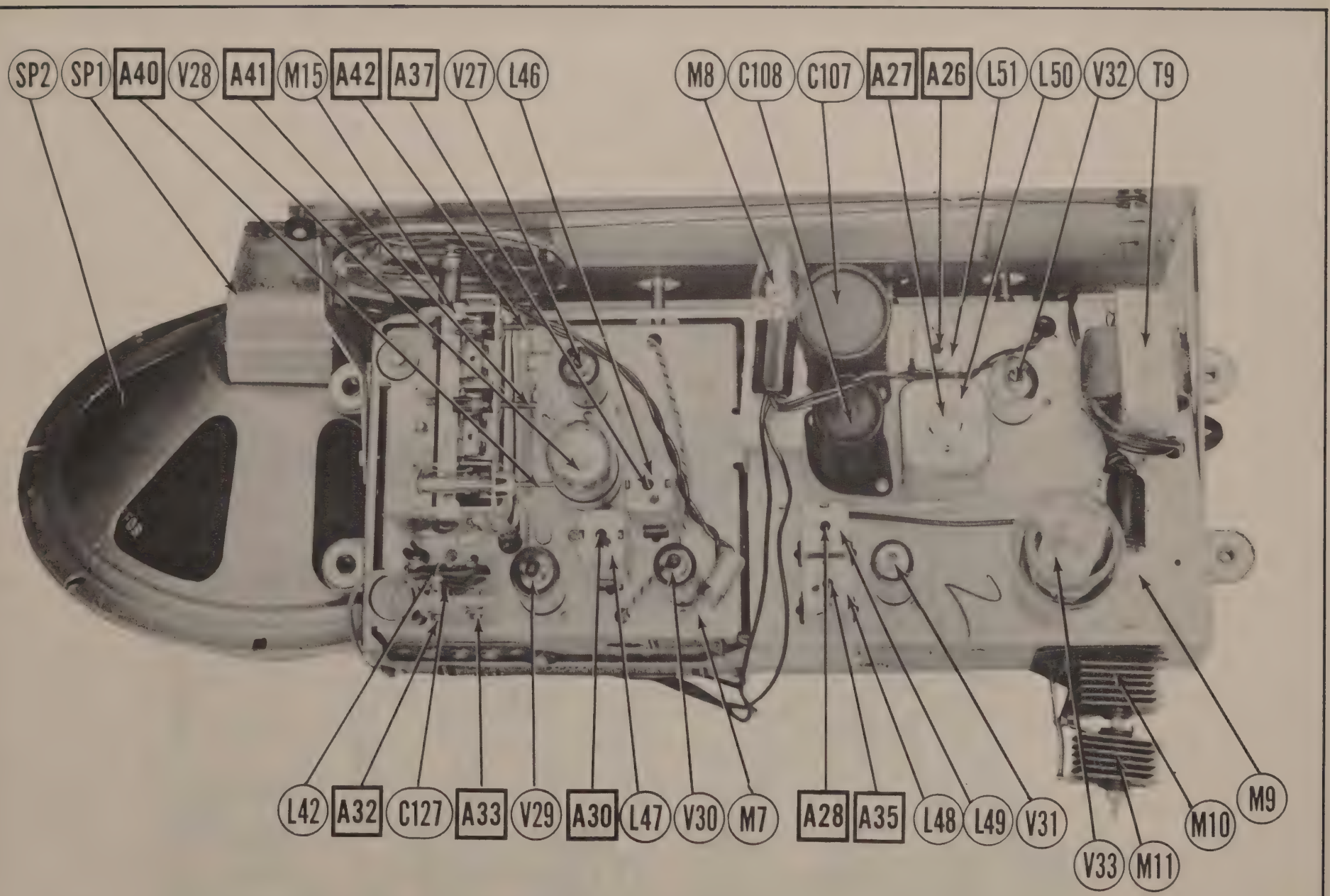
§ TAKEN WITH VACUUM TUBE VOLTMETER.
• DO NOT MEASURE.
† TAKEN IN "FM" POSITION.

RESISTANCE READINGS

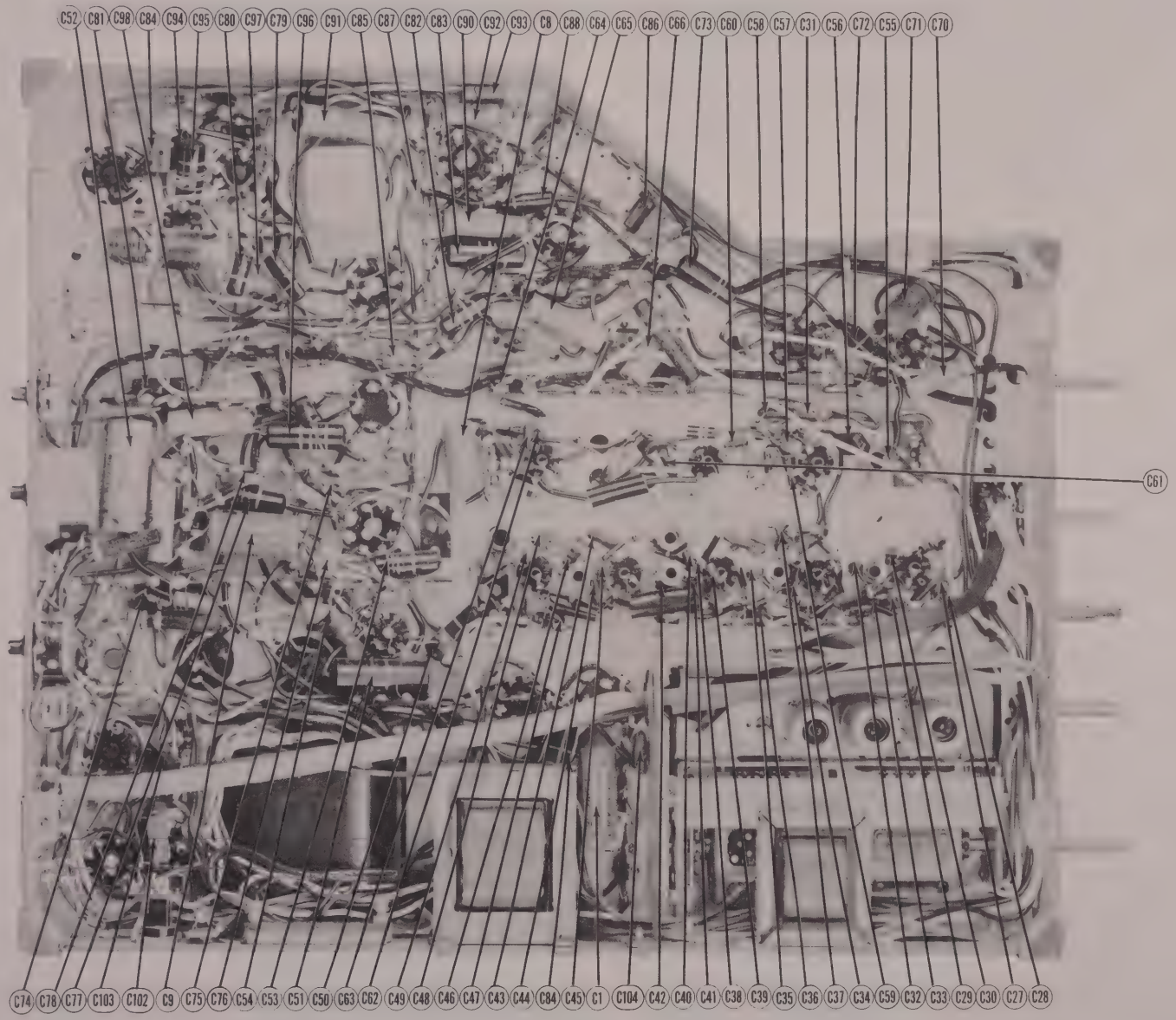
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	230KΩ	47Ω	0Ω	.1Ω	†3.9KΩ	†1.2KΩ	47Ω		
V 2	6AG5	100KΩ	0Ω	.1Ω	0Ω	†3.5KΩ	†56KΩ	0Ω		
V 3	6J6	#8KΩ	#8KΩ	0Ω	.1Ω	800KΩ	22KΩ	220Ω		
V 4	6AG5	140KΩ	120Ω	0Ω	.1Ω	†800Ω	†800Ω	120Ω		
V 5	6AG5	135KΩ	120Ω	0Ω	.1Ω	†470Ω	†470Ω	120Ω		
V 6	6AG5	135KΩ	68Ω	0Ω	.1Ω	†470Ω	†470Ω	68Ω		
V 7	6AG5	.2Ω	100Ω	0Ω	.1Ω	†8KΩ	†1.5KΩ	100Ω		
V 8	6AL5	.2Ω	150KΩ	0Ω	.1Ω	100Ω	Inf.	3.3KΩ		
V 9	12AU7	†9.8KΩ	1 Meg.	0Ω	.1Ω	.1Ω	#14KΩ	380KΩ	3KΩ	0Ω
V 10	7F7	.1Ω	0Ω	#47KΩ	1 Meg.	0Ω	0Ω	1 Meg.	0Ω	
V 11	6BA6	470KΩ	0Ω	0Ω	.1Ω	†1.8KΩ	†1.8KΩ	68Ω		
V 12	6AU6	68KΩ	0Ω	0Ω	.1Ω	†10KΩ	†10KΩ	0Ω		
V 13	6AL5	750KΩ	750KΩ	3Ω	.1Ω	75KΩ	Inf.	75KΩ		
V 14	6AU6	4.7 Meg.	0Ω	0Ω	.1Ω	#49KΩ	#560KΩ	0Ω		
V 15	6K6GT	Inf.	.1Ω	#2.8KΩ	#2KΩ	1 Meg.	Inf.	0Ω	270Ω	
V 16	7N7	.1Ω	0Ω	#15KΩ	500KΩ	4.7 Meg.	#20KΩ	0Ω	0Ω	
V 17	7N7	.1Ω	0Ω	#90KΩ	2 Meg.	2 Meg.	¶750KΩ ¶500KΩ	0Ω	0Ω	
V 18	6K6GT	Inf.	0Ω	#650Ω	#650Ω	2.2 Meg.	.1Ω	.1Ω	6KΩ 1000Ω	
V 19	7N7	.1Ω	280KΩ	#42KΩ	800KΩ	200KΩ	#78KΩ	0Ω	0Ω	
V 20	6BG6G	Inf.	.1Ω	0Ω	220KΩ	220KΩ	#560KΩ	0Ω	#4KΩ	TOP CAP ¶50Ω
V 21	5V4G	Inf.	230KΩ	Inf.	#85Ω	Inf.	#85Ω	Inf.	230KΩ	
V 22	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP Inf.
V 23	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ¶ 180Ω
V 24	5U4G	Inf.	20KΩ	Inf.	♦17Ω	Inf.	♦18Ω	Inf.	20KΩ	
V 25	7Z4	.1Ω	Inf.	♦11Ω	Inf.	Inf.	♦10.5Ω	25KΩ	0Ω	
V 26	10BP4	0Ω	1.5 Meg.	PIN 10 #5KΩ	PIN 11 140KΩ	PIN 12 .1Ω				
† V 27	12AU6	1 Meg.	140Ω	27Ω	29Ω	▲180Ω	▲15KΩ	240Ω		
† V 28	14F8	15KΩ	22Ω	▲20KΩ	68Ω	1.5KΩ	▲20KΩ	16Ω	10KΩ	
V 29	12AU7	▲43KΩ	15KΩ	68Ω	22Ω	27Ω	▲20KΩ	4.5 Meg.	1.5KΩ	25Ω
V 30	6BJ6	4.5 Meg.	115Ω	29Ω	29Ω	▲4.3KΩ	▲4.3KΩ	68Ω		
V31	6BJ6	10Ω	68Ω	29Ω	28Ω	▲1.1KΩ	▲13KΩ	0Ω		
V32	19T8	Inf.	47KΩ	Inf.	0Ω	16Ω	370KΩ	0Ω	10 Meg.	▲270KΩ
† V32	19T8	Inf.	47KΩ	Inf.	0Ω	16Ω	370KΩ	0Ω	10 Meg.	▲270KΩ
V33	50C6G	0Ω	3Ω	▲360Ω	▲3.3KΩ	470KΩ	0Ω	28Ω	220Ω	

NOTE: AVC SWITCH IN "ON" POSITION FOR THESE MEASUREMENTS.
† MEASURED FROM PIN 7 OF V25.
# MEASURED FROM PIN 8 OF V24.
¶ MEASURED FROM PIN 8 OF V21.
♦ MEASURED FROM PIN 7 OF DEFLECTION COIL PLUG.
▲ MEASURED FROM OUTPUT OF M11.
† TAKEN IN "FM" POSITION.

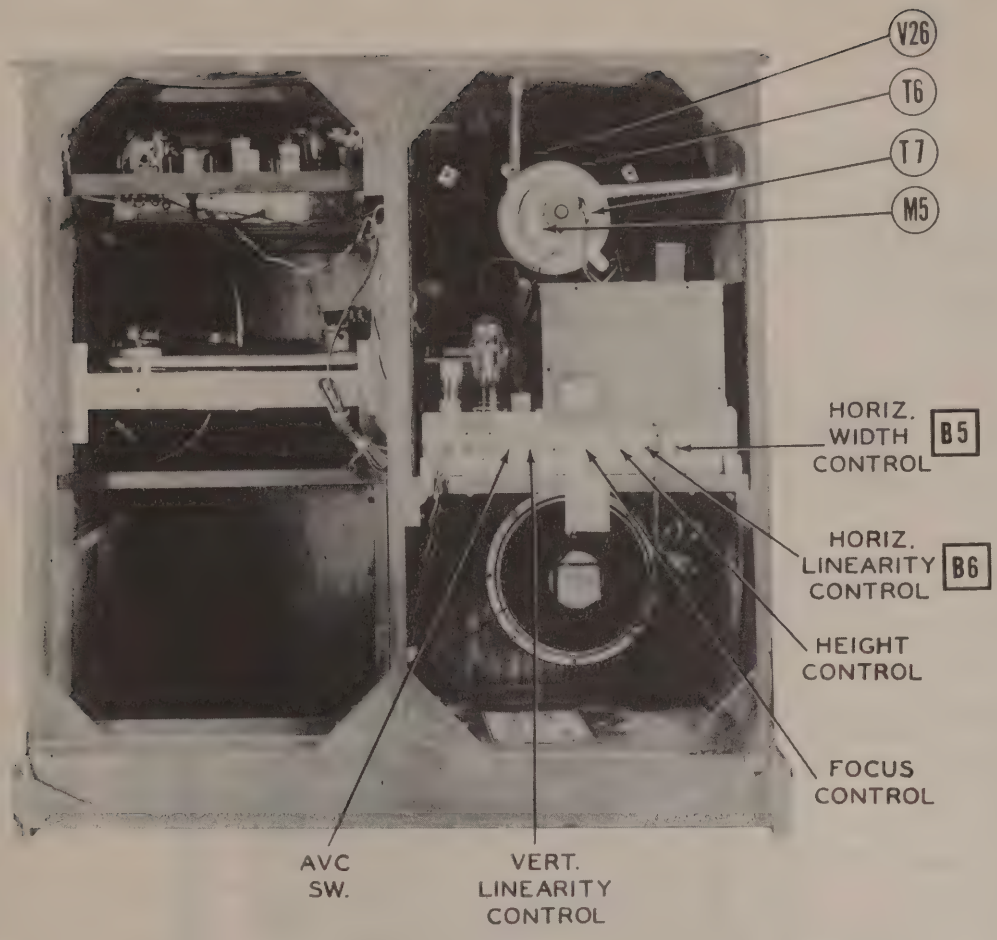
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RADIO CHASSIS-TOP VIEW



TV CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CABINET–REAR VIEW

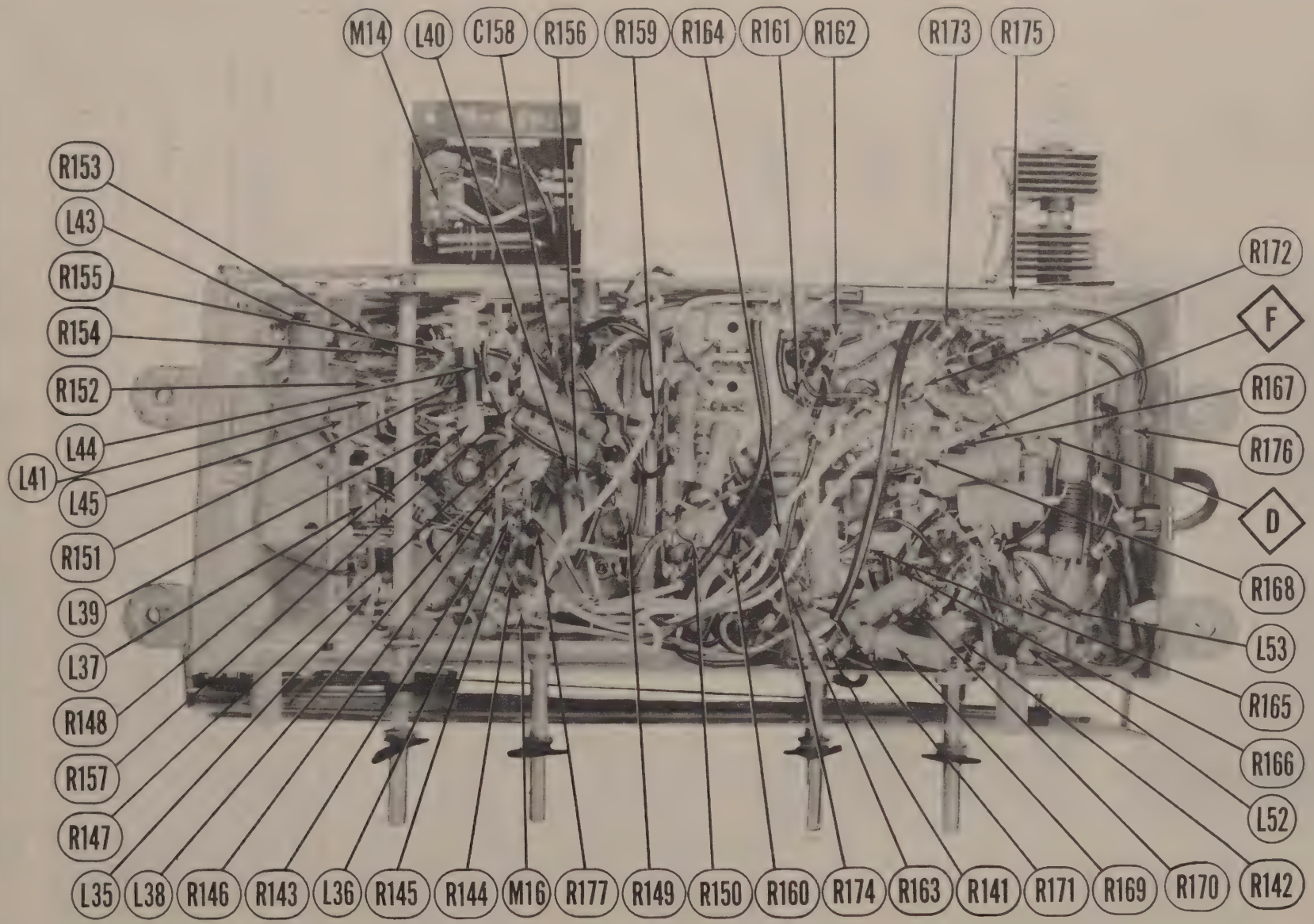
HORIZONTAL OSCILLATOR ADJUSTMENTS

1. Turn B1 (Frequency Adj.) one and a half turns from the maximum clockwise position.
2. Turn B2 (Drive Adj.) two turns from the maximum clockwise position.
3. Turn B3 (Horiz. Lock Trimmer) one half turn from the maximum clockwise position.
4. Set the horizontal hold control R1A to the center of its rotation.
5. Turn in a station and adjust B4 until picture "sync".
6. Turn the AVC "off" and adjust the contrast control (R3) for normal contrast.
7. Turn the horizontal hold control fully clockwise and adjust B4 until 8 to 10 blanking bars appear on the picture tube, sloping downward from the left side.
8. If this cannot be done turn B1 one turn counter-clockwise and repeat step 7.
9. Turn the horizontal hold control in the counter-clockwise direction until picture "sync".
10. Keep turning the horizontal hold control in the counter-clockwise direction until the picture falls out of "sync".
11. If the picture will not fall out of "sync" with the horizontal hold control turned fully counter-clockwise, turn the contrast control counter-clockwise until picture falls out of "sync" and then clockwise to the point where the picture reappears, but not in "sync".
12. Advance the horizontal hold control clockwise and count the number of blanking bars present. This number should decrease as synchronization is neared.
13. Just before the picture drops into "sync" there should be $3\frac{1}{2}$ to $4\frac{1}{2}$ bars sloping upward from the left side of the picture.
14. If more than $4\frac{1}{2}$ bars were present as outlined in step 13, turn B3 clockwise 1/4 turn and repeat steps 7 through 14. If less than $3\frac{1}{2}$ bars were present, turn B3 counter-clockwise 1/4 turn and repeat steps 7 through 14.

HORIZONTAL WIDTH AND LINEARITY ADJUSTMENTS

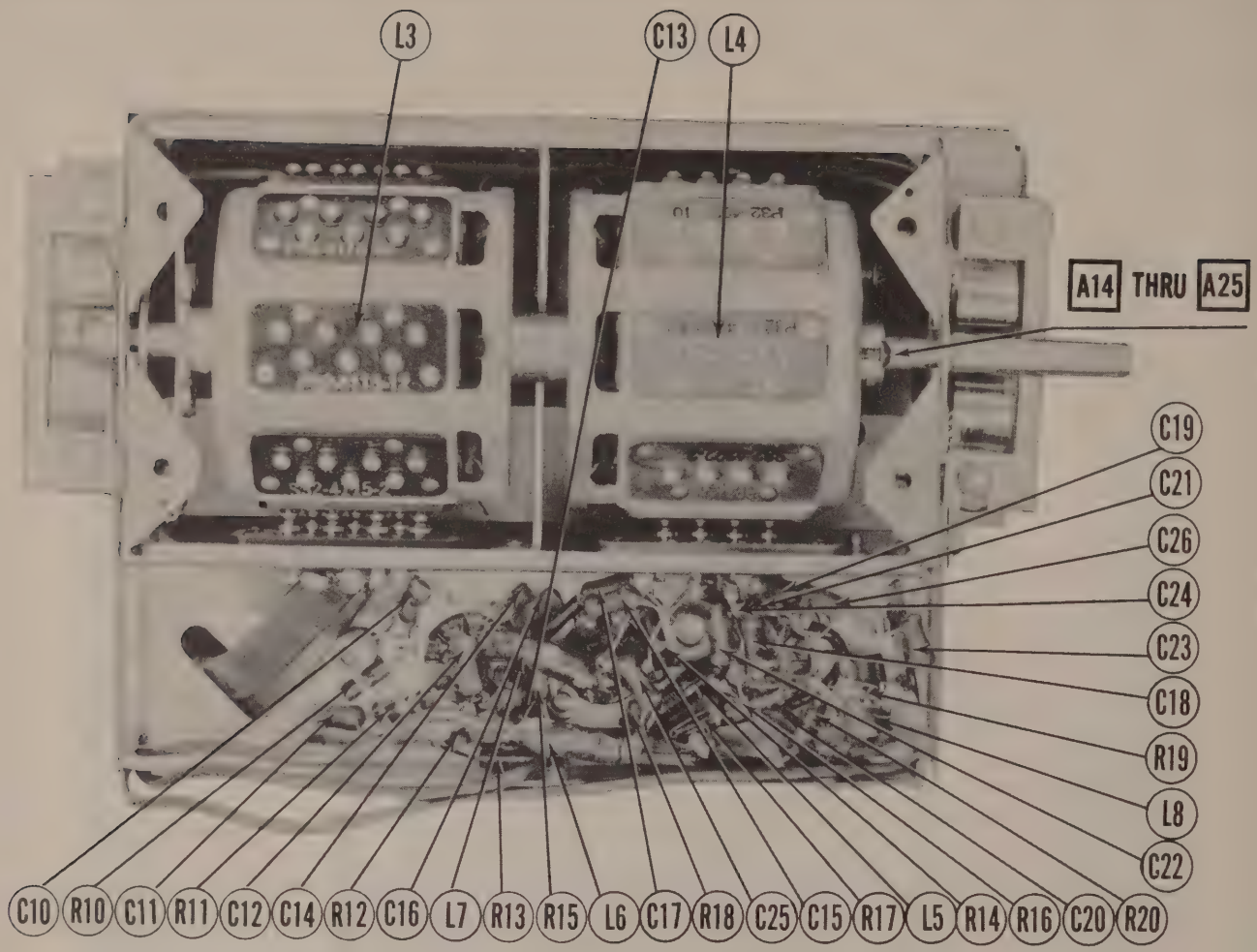
Adjust the width slug (B5) until the picture fills the mask horizontally.

Adjust the horizontal linearity slug (B6) until the picture is symmetrical from left to right. Slight readjustment of the horizontal drive (B2) may be necessary.



RADIO CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION

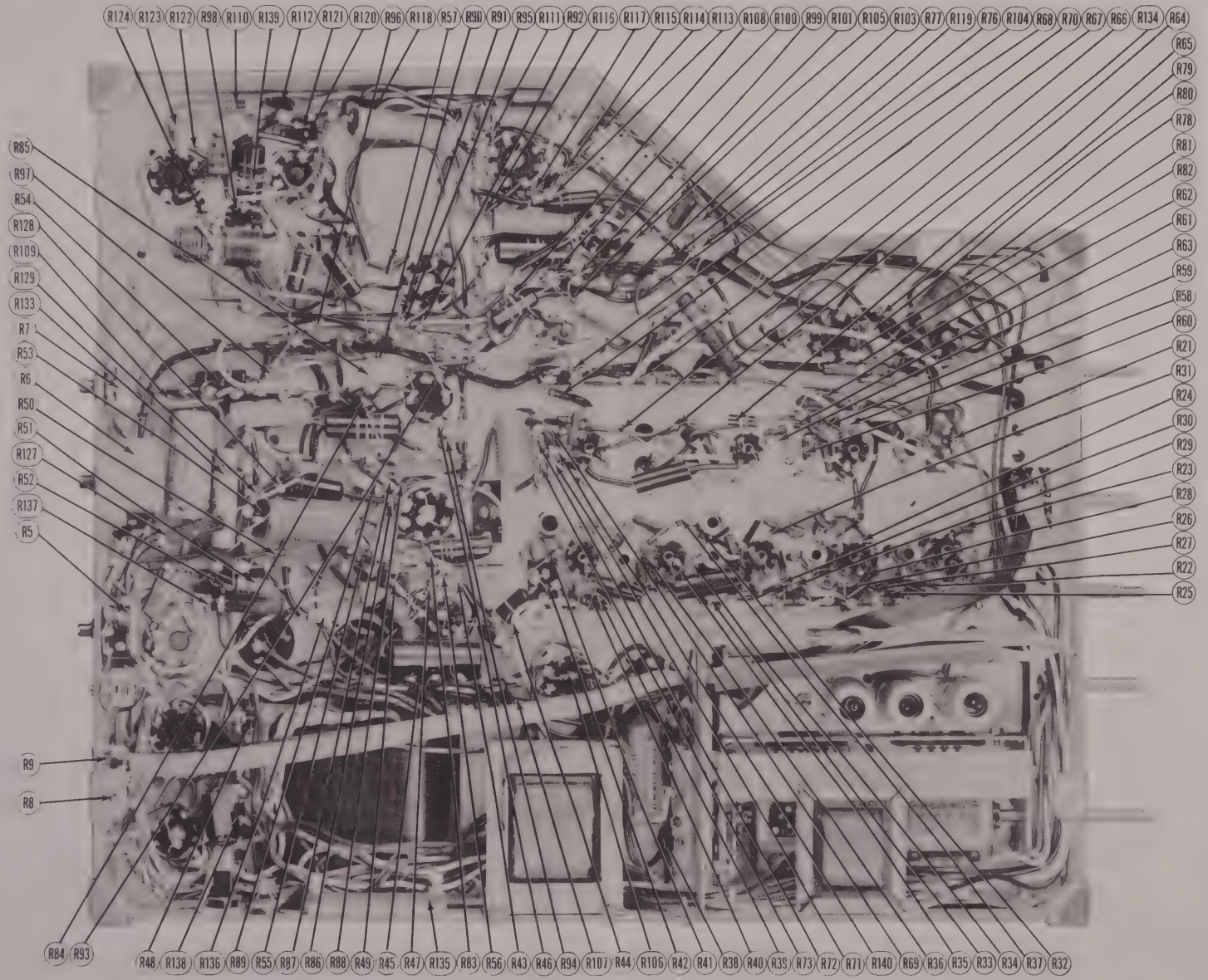
RADIO CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION



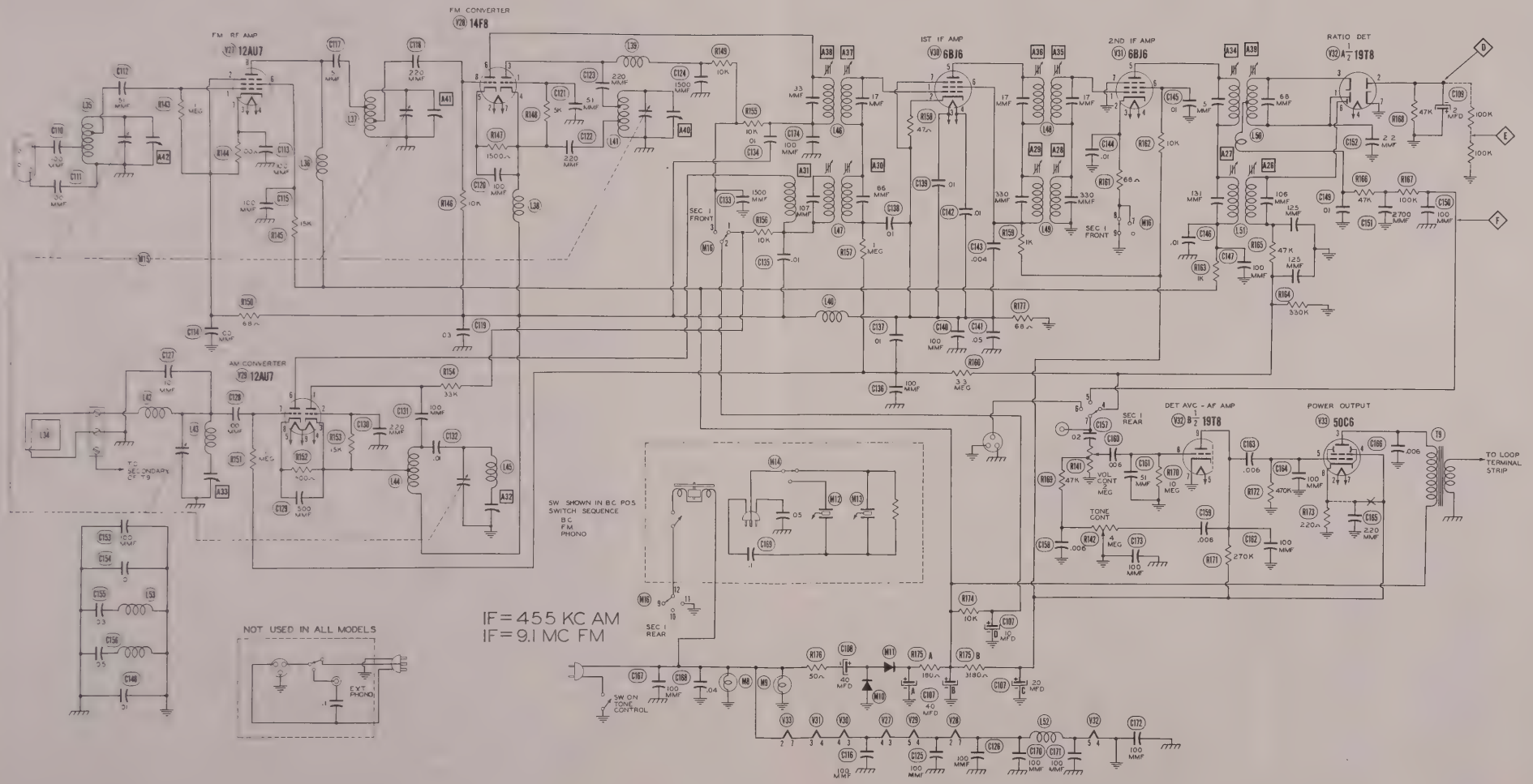
TV RF TUNER

DISASSEMBLY INSTRUCTIONS

1. Remove nine push-on type control knobs from TV and radio.
2. Remove twelve phillips head screws holding rear cover of TV section. Remove cover.
3. Remove twelve phillips head screws holding rear cover of radio-phono section. Remove cover.
4. Remove two phillips head screws holding rear cover of radio. Remove cover.
5. Remove speaker plug.
6. Remove picture tube base socket and HV cap.
7. Remove yoke plug.
8. Remove TV antenna plug from receiver chassis.
9. Remove green and black leads from terminals on rear of radio.
10. Remove power plug from TV chassis, left rear side.
11. Remove four 5/16" hex head bolts holding TV chassis. Remove chassis.
12. Remove two lamp sockets from bottom front center of cabinet.
13. Remove four 11/32" hex nuts holding speaker. Remove speaker.
14. Remove two phillips head screws holding rear picture tube supports.
15. Remove three 7/16" hex nuts holding front picture tube support. Remove picture tube.
16. Unsolder phono motor leads at splices.
17. Remove loop antenna leads from terminal strip.
18. Remove audio plug from rear of radio chassis.
19. Remove four 3/8" hex head bolts holding radio chassis. Remove chassis.
20. Remove phono plug from switch assembly under radio mounting board.
21. Remove two phillips head screws holding switch assembly and remove.



TV CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RADIO SCHEMATIC

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		PHILCO PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Mixer	6AG5	6AG5	7BD	
V3	Oscillator	6J6	6J6	7BF	
V4	1st Video IF	6AG5	6AG5	7BD	
V5	2nd Video IF	6AG5	6AG5	7BD	
V6	3rd Video IF	6AG5	6AG5	7BD	
V7	4th Video IF	6AG5	6AG5	7BD	
V8	Video Det.-AGC Rect.	6AL5	6AL5	6BT	
V9	Video Amp.	12AU7	12AU7	9A	
V10	DC Restorer-2nd Sync. Amp.	7F7	7F7	8AC	
V11	1st Sound IF	6BA6	6BA6	7BK	
V12	2nd Sound IF	6AU6	6AU6	7BK	
V13	Ratio Det.	6AL5	6AL5	6BT	
V14	AF Amp.	6AU6	6AU6	7BK	
V15	Audio Output	6K6GT	6K6GT	7S	
V16	1st Sync. Amp.-Sync. Sep.	7N7	7N7	8AC	
V17	Vert. Osc.	7N7	7N7	8AC	
V18	Vert. Output	6K6GT	6K6GT	7S	
V19	Hor. Osc.-Hor. AFC	7N7	7N7	8AC	
V20	Hor. Output	6BG6G	6BG6G	5BT	
V21	Damper	5V4G	5V4G	5L	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	HV Rectifier	1B3GT	1B3GT	3C	Not usedin models 49-1040 Code 123, 49-1077 Code 122, 49-1076 Codel 123
V24	LV Rectifier	5U4G	5U4G	5T	
V25	LV Rectifier	7Z4	7Z4	5AB	
V26A	Picture Tube	10BP4	10BP4	12D	Models 49-1040 Code 123, 49-1076 Code 123, 49-1175 Code 124, 49-1150 Code 124, 49-1077 Codel 122, 49-1150 Code 122, 49-1175 Code 122
B	Picture Tube	12LP4	12LP4	12D	Models 49-1240 Code 124, 49-1278 Code 123, 49-1279 Code 122, 49-1280 Code 121

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA				IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	ERIE PART No.	SPRAGUE PART No.	
C1	30	475	30-2568-19	AFN6X		TVL-7	Filter
C2A	40	475	30-2570-8	AF862J4A		TVL-38	▲ Filter
B	10	475					■ Decoupling
C	20	475					▲ Filter
D	10	25					Hor. Output Cath. Bypass *
C3	30	250	30-2568-19	AF6F		TVL-63	Filter
C4A	10	450	30-2570-16	AF22J4A		TVL-52	▲ Filter
B	10	450					■ Low Pass Filter
C	40	50					Vert. Output Cath. Bypass
C5A	10	475	30-2570-10	AF2222X		TVL-39	▲ Sync. Amp. Decoupling
B	10	475					■ 1st V. Amp. Plate Dec.
C	10	475					▲ Decoupling
D	10	475					Decoupling
C6A	10	450	45-3006	AF22J4A		TVL-52	■ Vert. Osc. Decoupling
B	10	450					▲ Vert. Amp. Decoupling
C	40	50					Output Cathode Bypass
C7	10	25	30-2417-1	E26E21		TVA-5	AGC Filter
C8	2	50	30-2417-7	E26E6		TVA-12	Stabilizing Cap.
C9	10	300	30-2417-6	PRS350/12		TVA-21	Decoupling
C10	220		62-122001001	GP220M	GP2K-220		RF Coupling
C11	470		62-147001001	GP470M	GP2K-470		AGC Filter
C12	470		62-147001001	GP470M	GP2K-470		RF Screen Bypass
C13	10		62-010009001	GP10M	GP1K-10		RF Screen Bypass
C14	470		62-147001001	GP470M	GP2K-470		RF Filament Bypass
C15	220		62-122001001	GP220M	GP2K-220		RF Coupling
C16	10		62-010009001	GP10M	GP1K-10		Mixer Screen Bypass
C17	470		62-147001001	GP470M	GP2K-470		Mixer Screen Bypass
C18	22		62-022009001	CN22JN330	N330-331-22		Osc. Grid Cap.
C19	10		62-010009001	CN10DN750	N750K-10		Osc. Grid Filter
C20	220		62-122001001	GP220M	GP2K-220		Osc. Cath. Bypass
C21	3.3		30-1221	CN3.3CNPO	NPOK-3.3		Freq. Comp.
C22	220		62-122001001	GP220M	GP2K-220		Phase Shifter
C23	470		62-147001001	GP470M	GP2K-470		AFC Filter
C24	3.3		30-1221	CN3.3CNPO	NPOK-3.3		Osc. Grid Filter ♦
C25	470		62-147001001	GP470M	GP2K-470		Decoupling
C26	470		62-147001001	GP470M	GP2K-470		Osc. Filament Bypass
C27	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	Mixer Plate Decoupling
C28	470		62-147001001	GP470M	GP2K-470	1FM-35	IF Coupling
C29	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	AGC Filter
C30	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	1st V.IF Decoupling
C31	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	Decoupling
C32	470		62-147001001	GP470M	GP2K-470	1FM-35	IF Coupling
C33	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	AGC Filter
C34	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	2nd V. IF Decoupling
C35	470		62-147001001	GP470M	GP2K-470	1FM-35	IF Coupling
C36	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	AGC Filter
C37	10		62-010009001	GP10M	GP1K-10	MS-41	2nd V. IF Decoupling ♦
C38	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	3rd V. IF Decoupling
C39	10		62-010009001	GP10M	GP1K-10	MS-41	3rd V. IF Decoupling ♦
C40	470		62-147001001	GP470M	GP2K-470	1FM-35	IF Coupling
C41	18		60-00185317	GP18K	GP1K-18		Fixed Trimmer
C42	18		60-00185317	GP18K	GP1K-18		Fixed Trimmer
C43	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	4th V. IF Cath. Bypass
C44	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	4th V. IF Decoupling
C45	470		62-147001001	GP470M	GP2K-470	1FM-35	IF Coupling
C46	100		62-110009001	GP100M	GP1K-100	1FM-31	IF Coupling
C47	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	AGC Filter
C48	56		62-056409001	CN56JN220	N220-331-56		Fixed Trimmer
C49	10		62-010009001	GP10K	GP1K-10	MS-41	V. Diode Filter
C50	.047	400	61-0122	P488-047		TM-15	Video Coupling

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C51	.22	400	45-3500-9	P488-22		TC-2	Video Coupling
C52	.5	400	45-3500-4	484-5		TC-5	Pic. Tube Cath. Bypass
C53	.047	400	45-3500-14	P488-047		TM-15	Video Coupling
C54	4000	500	45-3502	1467-004	811-005	1FM-24	Video Coupling
C55	56		62-056409001	CN56JN220	N220-331-56		Fixed Trimmer
C56	.01	100	30-1226-10	P488-01	821-01	TM-11	S. IF Coupling
C57	470		62-147001001	GP470M	GP2K-470	1FM-35	1st S. IF Cath. Bypass
C58	1500		62-215001001	GP1500M	GP2L-0015	1FM-215	Decoupling
C59	1500		62-215001001	GP1500M	GP2L-0015	1FM-215	1st S. IF Decoupling
C60	50		62-056409001	GP51M	GP1K-56	1FM-45	S. IF Coupling
C61	1500		62-215001001	GP1500M	GP2L-0015	1FM-215	2nd S. IF Decoupling
C62	1500		62-215001001	GP1500M	GP2L-0015	1FM-215	Diode Load Cap.
C63	1500		62-215001001	GP1500M	GP2L-0015	1FM-215	Diode Load Cap.
C64	100		62-110009001	GP100M	GP1K-100	1FM-31	AFC Filter
C65	.1	200	61-0113	P288-1		TM-1	AFC Filter
C66	.1	200	61-0113	P288-1		TM-1	AFC Filter
C67	.01	400	61-0120	P488-01	821-01	TM-11	Audio Coupling
C68	100		62-110009001	GP100M	GP1K-100	1FM-31	Tone Compensation
C69	.002	400	61-0062	P688-002	GP2M-002	TM-22	Tone Compensation
C70	.01	400	61-0120	P488-01	821-01	TM-11	Audio Coupling
C71	.1	400	61-0113	P488-1		TM-1	AF Amp. Screen Bypass
C72	.01	600	61-0120	P688-01	821-01	TM-11	Audio Coupling
C73	.0068	1000	61-0105	P1088-0068		MB-27	Output Plate Bypass
C74	.047	400	61-0122	P488-047		TM-15	Sync. Coupling
C75	330	500	60-10335407	1468-00035	GP2K-330	1FM-335	Sync. Coupling
C76	22	500	60-00245307	1468-000025	GP1K-22	MS-425	Sync. Sep. Grid Bypass
C77	.047	400	61-0122	P488-047		TM-15	Sync. Coupling
C78	220	500	62-122001001	1468-0002	GP2K-220	1FM-32	Sync. Amp. Grid Bypass
C79	.0022	600	61-0062	P688-0022	GP2M-0022	TM-22	Integrator Net.
C80	.0047	600	45-3502	P688-0047	811-005	TM-25	Integrator Net.
C81	.0047	600	45-3502	P688-0047	811-005	TM-25	Integrator Net.
C82	.0056	400	45-3502		GP2M-0056		Vert. Osc. Grid Cap. #
C83	.082	400	30-4651-3				Vert. Discharge §
C84	.1	400	61-0113	P488-1		TM-1	Vert. Sweep Coupling
C85	150	500	60-10155407	1468-00015	GP1K-150	1FM-315	Hor. Sync. Coupling
C86	180	500	30-1220-30	1468-0002	GP2K-180	1FM-32	Voltage Divider
C87	270	500	60-10275407	1468-00025	GP2K-270	1FM-325	Hor. Osc. Grid Cap.
C88	.0022	600	61-0062	P688-0022	GP2M-0022	TM-22	Hor. Coupling
C89	5	500	60-90505007	1468-000005	NPOK-5	MS-55	Hor. Feedback
C90	.05	400	61-0122	P488-05		TM-15	Hor. AFC Plate Bypass
C91	.25	400	61-0125	P488-25		TC-2	AFC Filter
C92	.02	400	61-0108	P488-02		TM-12	AFC Filter
C93	1500	500	60-20155404	1467-0015	GP2L-0015	1FM-215	Hor. Discharge
C94	390	500	60-10305307	1468-0004	GP2K-390	1FM-34	Hor. Sweep Coupling
C95	.082	400	30-4651-3				Damper Filter
C96	.082	400	30-4651-3				Damper Filter
C97	.5	200	61-0133	P288-5		TC-5	Hor. Sweep Coupling
C98	.1	200	61-0113	P288-1		TM-1	Bias Filter
C99	500	20000	30-1229 -2		410-500		Voltage Doubler Cap. *
C100	500	20000	30-1229 -2		410-500		HV Filter *
C101	500	20000	30-1229 -2		410-500		HV Filter
C102	.01	400	30-1226-1	P488-01	821-01	TM-11	Line Filter
C103	.01	400	30-1226-1	P488-01	821-01	TM-11	Line Filter
C104	1000	500		1468-001	GP2L-001	1FM-21	RF Bypass ♦
C105	680	500	60-10685401	1468-00075	GP2K-680	1FM-37	Hor. Output Cath. Bypass †
C106	150	500	60-10155407	1468-00015	GP2K-150	1FM-315	Vert. Amp. Plate Bypass ‡

*, Used only in models 49-1040 Code 123, 49-1076 Code 123, and 49-1077 Code 122
† Used only in models 49-1076 Code 123 and 49-1077 Code 122
‡ Used only in models after ' 49-1040 Code 123, run 3, 49-1076 Code 123 run 1, 49-1077 code 122 run 1, 49-1040 Code 124 run 3, 49-1279 Code 122 run 3 and 49-1280 Code 121 run 3.
§ Some models use .05MFD MFGR'S Part No. 61-0122 in this application.
# Some models use .0047MFD MFGR'S Part No. 45-3502 in this application.
♦ Not used in all models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	50KΩ	½	33-5563-3	B11-123 *		Horiz. hold control, panel
B	1 Meg.	½		B11-137 *		Vert. hold control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit"
R2A	2 Meg.	½	76-3964			Volume control and AC switch, tapped at 1 Meg.
B	Switch					Television-Radio switch
R2A	2 Meg.	½	33-5564	Q18-139X		Volume control, tapped at 1 Meg. See Note 1
B	Switch			76-1		Attach to R2A per instructions
R3A	2500Ω	2	33-5563-14			Contrast control-Wire Wound
B	250KΩ	½				Channel adjust control and switch --
R3	5000Ω	2	33-5546-11	W-5000	43-5000	Contrast control-Wire Wound-See Note 2
R4	100KΩ	½	33-5539-43	Q11-128	M-49-S	Brightness control
R5	5000Ω	2	33-5546-10	W-5000	43-5000	Vert. linearity control-Wire Wound
R6	500Ω	25	33-5547 5	PR-25-500	PW-25-500	Focus control-Wire Wound
R6	200Ω	4	33-5546-13			Focus control-Wire Wound-See Note 3
R7	250KΩ	½	33-5539-42	Q11-130	M-55-S	Height control

* Additional parts to be used with "Concentrikit".
Note 1. Used in models 49-1150, Code 122 and 124, 49-1040 Code 123, and 49-1240 Code 124.
Note 2. Not used in models 49-1175, 49-1150 Code 124.
Note 3. Used only in models 49-1040, 1076, Code 123, 49-1077, 1175, and 49-1150 Code 122.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R8	220Ω	½	66-1228340		Ant. Loading
R9	220Ω	½	66-1228340		Ant. Loading
R10	100KΩ 20%	½	66-4108340		RF Grid
R11	47Ω	½	66-0478340		RF Cathode
R12	2700Ω	½	66-2278340	BTS-2700	RF Plate
R13	1000Ω	½	66-2108340	BTS-1000	RF Decoupling
R14	100KΩ	½	66-4108340		Mixer Grid
R15	56KΩ	½	66-3568340	BTS-56K	Mixer Screen
R16	22KΩ	½	66-3224340	BTS-22K	Osc. Grid
R17	220Ω	½	66-1228340		Osc. Cathode
R18	22KΩ	1	66-3224340	BTA-22K	Voltage Divider

TV PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (CONT.)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	
R19	22KΩ	½	66-3224340	BTS-22K	AFC Grid
R20	560Ω	½	66-1568340	BTS-560	AFC Filter
R21	3300Ω	½	66-2338340	BTS-3300	Decoupling
R22	8200Ω	½	66-2828340	BTS-8200	1st Video IF Grid
R23	120Ω	½	66-1128340	BW-½-120	1st Video IF Cathode-Wire Wound
R24	330Ω	½	66-1334340		1st Video IF Decoupling
R25	33000Ω 20%	½	66-2338340	BTS-3300	AGC Network
R26	33000Ω 20%	½	66-2338340	BTS-3300	AGC Network
R27	5600Ω	½	66-2568340	BTS-5600	2nd Video IF Grid
R28	120Ω	½	66-1128340	BW-½-120	2nd Video IF Cathode-Wire Wound
R29	3300Ω 20%	½	66-2338340	BTS-3300	AGC Network
R30	5600Ω	½	66-2568340	BTS-5600	3rd Video IF Grid
R31	68Ω	½	66-0688340		3rd Video IF Cathode
R32	8200Ω	½	66-2828340		4th Video IF Coil Shunt-See Note 4
R33	22KΩ	½	66-3228340		Video IF Filter Network
R34	15KΩ	½	66-3158340	BTS-15K	4th Video IF Grid Coil Shunt
R35	100Ω	½	66-1108340		4th Video IF Cathode
R36	6800Ω	½	66-2688340	BTS-6800	4th Video IF Plate
R37	1000Ω	½	66-2108340	BTS-1000	4th Video IF Decoupling
R38	10KΩ	½	66-3108340	BTS-10K	AGC Network
R39	120KΩ	½	66-4128340	BTS-120K	AGC Diode Load
R40	27KΩ	½	66-3278340	BTS-27K	AGC Diode Filter
R41	47KΩ	½	66-3478340	BTS-47K	Peaking Coil Shunt
R42	3300Ω	½	66-3338340	BTS-3300	Video Det. Diode Load
R43	1 Meg. 20%	1	66-5108340	BTS-1 Meg.	Video Amp. Grid
R44	47KΩ	½	66-3478340	BTS-47K	Peaking Coil Shunt
R45	4700Ω	1	66-2475340	BTA-4700	Video Amp. Plate
R46	4700Ω	1	66-2474340	BTA-4700	Video Amp. Plate Decoupling
R47	330KΩ	½	66-4338340	BTS-330K	Video Amp. Grid
R48	47Ω	½	66-0478340	BW-½-47	Video Amp. Cathode
R49	47KΩ	½	66-3478340	BTS-47K	Peaking Coil Shunt
R50	10KΩ	½	66-3108340	BTS-10K	Video Output Plate
R51	3300Ω 5%	1	66-2338340	BTA-3300	Video Output Plate
R52	1000Ω	½	66-2108340	BTS-1000	Video Output Plate
R53	10KΩ	2	66-3108340	BT 2 10K	Low Pass Filter
R54	100KΩ 20%	½	66-4108340	BTS-100K	Voltage Divider
R55	10KΩ	½	66-3108340	BTS-10K	Phase Correction
R56	470KΩ 20%	½	66-4478340	BTS-470K	Picture Tube Grid
R57	1 Meg. 20%	½	66-5108340	BTS-1 Meg.	DC Rest. Load
R58	470KΩ 20%	½	66-4478340		1st Sound IF Grid
R59	68Ω	½	66-0688340		1st Sound IF Cathode
R60	22KΩ	½	66-3228340		1st Sound IF Transformer Shunt
R61	1000Ω	½	66-2108340	BTS-1000	1st Sound IF Decoupling
R62	330Ω	½	66-1338340		Decoupling
R63	68KΩ	½	66-3688340	BTS-68K	2nd Sound IF Grid
R64	22KΩ	½	66-3228340	BTS-22K	Voltage Divider
R65	10KΩ	½	66-3108340		2nd Sound IF Decoupling
R66	47Ω	½	66-0478340		Balancing
R67	470KΩ	½	66-4478340	BTS-470K	AFC Network
R68	470KΩ	½	66-4478340	BTS-470K	AFC Network
R69	68000Ω	½	66-2688340	BTS-6800	Balancing-See Note 15
R70	10KΩ	½	66-3108340	BTS-10K	De-emphasis
R71	6800Ω	½	66-2688340	BTS-6800	Balancing-See Note 15
R72	68KΩ	½	66-3688340	BTS 68K	Ratio Det. Diode Load
R73	68KΩ	½	66-3688340	BTS-68K	Ratio Det. Diode Load
R74	47KΩ	½	66-3478340	BTS-47K	Tone Compensation
R75	330KΩ	½	66-4338340	BTS-330K	Bias Filter-See Note 5
R76	270KΩ	½	66-4278340	BTS-270K	Voltage Divider-See Note 5
R77	15KΩ	½	66-3158340	BTS-15K	Voltage Divider-See Note 5
R78	4.7 Meg. 20%	½	66-5478340	BTS-4.7 Meg.	AF Grid
R79	560KΩ	½	66-4564340	BTS-560K	AF Screen
R80	47KΩ	1	66-3474340	BTA-47K	AF Plate
R81	1 Meg. 20%	½	66-5108340	BTS-1 Meg.	Output Grid
R82	270Ω	1	66-1274340	BW-1-270	Output Cathode-Wire Wound
R83	470KΩ 20%	½	66-4478340	BTS-470K	1st Sync. Amp. Grid
R84	10KΩ	2	66-3108340	BT-2-10K	1st Sync. Amp. Plate
R85	5100Ω	5	33-1335-18	AB-5000	Decoupling-Wire Wound
R86	10KΩ	½	66-3108340	BTS-10K	Sync. Sep. Grid
R87	4.7 Meg.	½	66-5478340	BTS-4.7 Meg.	Sync. Sep. Grid
R88	10KΩ	½	66-3108340	BTS-10K	Voltage Divider
R89	56KΩ	1	66-3564340	BTA-56K	Sync. Sep. Plate
R90	1 Meg.	½	66-5108340	BTS-1 Meg.	Voltage Divider
R91	10KΩ	½	66-3108340	BTS-10K	2nd Sync. Amp. Grid
R92	10KΩ	½	66-3108340	BTS-10K	2nd Sync. Amp. Plate
R93	3900Ω	½	66-2398340	BTS-3900	2nd Sync. Amp. Plate
R94	33KΩ	1	66-3334340	BTA-33K	2nd Sync. Amp. Plate Decoupling
R95	22KΩ	½	66-3228340	BTS-22K	Integrator
R96	8200Ω	½	66-2828340	BTS-8200	Integrator
R97	8200Ω	½	66-2828340	BTS-8200	Integrator
R98	100KΩ	1	66-4104340	BTA-100K	Vert. Osc. Plate Decoupling
R99	68KΩ	½	66-3688340	BTS-68K	Vert. Osc. Grid-See Note 6
R100	10KΩ	½	66-3108340	BTS-10K	Vert. Osc. Grid
R101	1 Meg.	½	66-5108340	BTS-1 Meg.	Voltage Divider
R102	100KΩ 20%	½	66-4108340	BTS-100K	Voltage Divider-See Note 7
R103	470KΩ	1	66-4474340	BTA-470K	Vert. Osc. Plate
R104	10KΩ	½	66-3108340	BTS-10K	Vert. Osc. Plate Decoupling
R105	470Ω	1	66-1478340		Parasitic Supp. -See Note 5
R106	2.2 Meg. 20%	½	66-5228340	BTS-2.2 Meg.	Vert. Output Grid
R107	1000Ω	1	66-2104340	BTA-1000	Vert. Output Cathode
R108	3300Ω	½	66-2338340	BTS-3300	Vert. Peaking-See Note 8
R109	68KΩ	½	66-3684340	BTA-68K	Voltage Divider
R110	220KΩ	½	66-4228340	BTS-220K	AFC Feedback
R111	10KΩ 5%	½	66-3106340	BTS-10K-5%	Horiz. Osc. Transformer Shunt
R112	68KΩ 5%	1	66-3684340	BTA-68K-5%	Horiz. Osc. Plate-See Note 9
R113	100KΩ 5%	1	66-4104340	BTA-100K-5%	Horiz. Osc. Grid
R114	100KΩ 5%	1	66-4104340	BTA-100K-5%	Voltage Divider
R115	180KΩ	½	66-4188340	BTS-180K	Horiz. AFC Filter Network
R116	3.3 Meg. 5%	1	66-5334340	BTA-3.3 Meg. 5%	Voltage Divider
R117	560KΩ	½	66-4568340	BTS-560K	Horiz. AFC Grid
R118	8200Ω	½	66-2828340	BTS-8200	Horiz. Peaking
R119	42KΩ	½	33-1343-2		Voltage Divider-Temp. Comp.
R120	82KΩ	½	66-3824340	BTA-82K	Voltage Divider
R121	10KΩ	½	66-3108340	BTS-10K	Decoupling
R122	100Ω 20%	½	66-1108340		Parasitic Supp.

RESISTORS (CONT.)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	
R123	220KΩ	½	66-4228340	BTS-220K	Horiz. Output Grid
R124	3900Ω	2	66-2395340	BT-2-3900	Horiz. Output Screen
R125	100Ω	5	66-1105340	AB-100	Horiz. Output Cathode-Wire Wound-See Note 10
R126	100Ω	5	66-1105340	AB-100	Horiz. Output Cathode-Wire Wound-See Note 11
R127	12Ω	2	66-0125340	BW-2-12	Bias Network-Wire Wound
R128	12Ω	2	66-0125340	BW-2-12	Bias Network
R129	47KΩ	½	66-3478340	BTS-47K	Bias Filter
R130	2 Meg.	5	33-1338		HV Rect. Load-Wire Wound
R131	680KΩ	1	66-4684340		HV Filter-See Note 12
R132	680KΩ	1	66-4684340		HV Filter-See Note 12
R133	10KΩ	9	33-1336-21	AB-10,000	Decoupling-Wire Wound
R134	270Ω	2	66-1274340	BW-2-270	Filter-Wire Wound
R135	1900Ω	10	33-3435-15	AB-2000	Filter-Wire Wound
R136	1 Meg.	1	66-5104340	BTA-1 Meg.	Bleeder-See Note 13
R137	56Ω	2	66-0565340		Surge Limiter-Wire Wound
R138	33Ω	½	66-0338340	BW-½-33	Series Dial Lamp
R139	560KΩ 5%	½	66-4568340	BTS-560K-5%	Feedback
R140	4.7Ω	½	66-9478340	BW-½-4.7	Ratio Det. Filament-Wire Wound-See Note 14

Note 4. Some models use 15KΩ resistor in this application.
Note 5. Used in models 49-1150, 1175, code 124 only.
Note 6. This item changed from 10KΩ to 68KΩ in model 49-1040 Code 123, run 6, models 49-1076, code 123, 49-1077 code 122, run 3 and models 49-1240, code 124, 49-1278, code 123, 49-1279, code 122, 49-1280 code 121, run 5.
Note 7. Not used in all models.
Note 8. Added in model 49-1240, code 124, 49-1278, code 123, 49-1279, code 122, 49-1280, code 121, run 5. Model 49-1040, code 123, run 6 and models 49-1076, code 123, 49-1077, code 122 run 3.
Note 9. Some models use 120KΩ resistor in this application.
Note 10. Used only in models 49-1240, code 124, 49-1040 code 123, 49-1076 code 123, 49-1077 code 122.
Note 11. Used only in model 49-1040 code 123.
Note 12. Used only in models 49-1040 code 123, 49-1076 code 123, and 49-1077 code 122.
Note 13. Models 49-1150, 49-1175, code 122, use 220KΩ resistor in this application.
Note 14. Added in all models run 4, except models 49-1150, 49-1175 code 122 and code 124.
Note 15. Added in all models run 2 except model 49-1150, 49-1175 code 122 and code 124.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ① 2A	710VCT .200ADC & 440VCT SEC. 4 .090ADC	5VAC ② 3A 6.3VAC ③ 9.6A	5VAC ② 2A	32-8376	P-8157 ④		TP-450

④ Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	DC RESISTANCE PRI.	SEC.	PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
T2	39Ω	98Ω	32-4367				
T3	166Ω	320Ω	32-8304-3			TBO-1	Hor. Block Osc. Trans. Vert. Block Osc. Trans.
T4A	280Ω Tap ② 40Ω	SEC. 1 2.5Ω	32-8358				Hor. Output Trans for 12" models and 49-1150 and 1175 code 124.
		SEC. 2 0Ω					
		SEC. 3 0Ω					
B	280Ω Tap ② 40Ω	SEC. 1 9.3Ω Tap ② .9Ω	32-8398				Hor. Output Trans. for models 49-1150 and 1175 code 122
		SEC. 2 0Ω					
		SEC. 3 0Ω					
C			32-8931				Hor. Output Trans. for models 49-1040, 1076, 1077
T5A	650Ω	8Ω	32-8206-1	A-8115	A-3035	TSO-1	Vert. Output Trans.
B	650Ω	4.4Ω	32-8306-1 ⑤	A-8115	A-3035	TSO-1	Vert. Output Trans.
T6A	9.5Ω		32-9804				Hor. Deflection Coil
B	30Ω						
T7A	130Ω		76-2622-1 ⑥				Focus Coil
B	160Ω		76-2622-3 ⑦				Focus Coil

⑤ Used in models 49-1150 and 1175 code 122.
⑥ Used in models having 10" picture tube.
⑦ Used in models having 12" picture tube.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
	FIELD	V. C. IMP.	PHILCO PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	3.7Ω	36-1610-2	ST-120 ① MOD. P10-S	10A31	① Replace output transformer to match 6-8Ω voice coil.
B	PM	3.7Ω	36-1507-3 ②	ST-803 MOD. P525-V	52A1	② Used in consolette models.
	CONE DIA.	V. C. DIA.				
SP2A	9 3/8"	1"				
B	5 1/8"	3/4"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 cps	PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.200A	85Ω	5.5 Henries	32-8366	C-1646 ③	C-3196 ③	R-7200 ④	③ Drill new mounting holes.
L2	.090A	153Ω	6 Henries	32-8355-1	C-2303 ④	C-2974 ④	R-885 ④	④ Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L3 ●	Ant. & RF Assy.	0Ω		32-4115		Add channel number as a suffix to part number for channel desired.
L4	Osc. & Mixer Assy.	0Ω		32-4222		Add channel number as a suffix to part number for channel desired.
L5	RF Choke	.2Ω		32-4112-2		
L6	RF Choke	.2Ω				
L7	Fil. Choke	.1Ω		32-4112-11		
L8	Fil. Choke	0Ω		32-4112-4		
L9	1st Video IF	.2Ω		32-4359-4		
L10	Fil. Choke	.1Ω		32-4112-11		
L11	RF Choke	.1Ω		32-4112-11		
L12	3rd Video IF	.2Ω		32-4359		
L13	RF Choke	.1Ω		32-4112-11		
L14	4th Video IF	.2Ω		32-4234-3		
L15	Adj. Channel Trap	0Ω		32-4234-4		
L16	5th Video IF	.2Ω		32-4333-2		
L17	6th Video IF	.2Ω		32-4234-1		
L18	Fil. Choke	.1Ω		32-4112-11		
L19	Fil. Choke	.1Ω		32-4112-11		
L20	Peaking	4.8Ω		32-4303		
L21	Sound Trap	0Ω		32-4302		
L22	Peaking	6Ω		32-4143-7		
L23	Peaking	6Ω		32-4143-7		
L24	Peaking	8Ω		32-4143-7		
L25	Peaking	5Ω		32-4143-5		
L26	Peaking	5.5Ω		32-4143-7		
L27	1st Sound IF	0Ω		32-4303		
L28	2nd Sound IF	.5Ω	.5Ω	32-4236		
L29	Ratio Det. Trans.	.1Ω	0Ω	32-4317		
L30	Fil. Choke	.1Ω		32-4112-11		
L31	Fil. Choke	.1Ω		32-4112-11		
L32	Width Cont.	3Ω		46-9527		
L33	Hor. Linearity	17.5Ω		32-4211		
L34	2nd Video IF	.2Ω		32-4359		

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M1	RF Tuner	78-3109-2	
M2	Fuse	45-2656-8	Type AGC .25A
M3	Terminal Board	76-4239	Width Cont.
M4	AVC Switch	42-1863	
M5	Ion Trap	76-3913	Permanent Magnet Type
M6	Phono-TV Switch	42-1863	Model 49-1040, 49-1240
	Cabinet	10716E	Model 49-1040
	Cabinet	10711F	Model 49-1076M
	Cabinet	10711G	Model 49-1076L
	Cabinet	10738-3	Model 49-1077
	Cabinet	10716G	Model 49-1150
	Cabinet	10738-5	Model 49-1175
	Cabinet	10716	Model 49-1240M
	Cabinet	10716A	Model 49-1240L
	Cabinet	10711M	Model 49-1278M
	Cabinet	10711N	Model 49-1278L
	Cabinet	10738	Model 49-1279
	Cabinet	10736	Model 49-1280
	Back	54-7747	Phono, Model 49-1280
	Back	54-7608	Radio, Models 49-1076, 49-1278
	Back	54-7748	Radio, Models 49-1077, 49-1279
	Back	76-4816	Radio, Model 49-1280
	Back	54-7735	TV Model 49-1040
	Back	56-5728	TV, Models 49-1076, 49-1278
	Back	54-7711-1	TV, Model 49-1077
	Back	54-7712	TV, Model 49-1240
	Back	54-7713-1	TV, Model 49-1279
	Back & Cup Assy.	76-4470	TV, Model 49-1280
	Back	54-7748	Radio, Model 49-1175
	Back	54-7735	TV, Model 49-1150
	Back	54-7735-1	TV, Model 49-1150 Code 122
	Back	54-7713-1	TV, Model 49-1175
	Knob	54-4376	Control
	Knob	54-4925-1	Hor. Hold — Mahogany
	Knob	54-4567	Vert. Hold
	Knob	56-4925-3	Channel Selector
	Knob	54-4248	Control
	Knob	54-4925-5	Hor. Hold — Blonde models 49-1278, 49-1279, 49-1280, 49-1076, 49-1077
	Knob	54-4567-1	Vert. Hold
	Knob	56-4925-4	Channel Selector
	Knob	54-4248	Control
	Knob	54-4925-5FCP	Hor. Hold — Blonde models 49-1150, 49-1175
	Knob	54-4567-1	Vert. Hold
	Knob	54-4925-4FCP	Channel Selector
	Safety Glass	54-7595-3	Model 49-1040, 49-1150
	Safety Glass	54-7598	Model 49-1078
	Safety Glass	54-7765	Model 49-1077
	Safety Glass	54-7848	Model 49-1175
	Safety Glass	54-7795-1	Model 49-1240
	Safety Glass	54-7609	Model 49-1278
	Safety Glass	54-7742	Model 49-1279
	Safety Glass	54-7739	Model 49-1280
	Trimmer Strip	31-6477-12	Hor. Osc. Range, Hor. Drive, Hor. Lock-In.

PHILCO MODELS 49-1040, 49-1076, 49-1077, 49-1150, 49-1175, 49-1240, 49-1278, 49-1279, 49-1280

RADIO **PARTS LIST AND DESCRIPTIONS**

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V27	FM RF Amp.	12AU6	12AU6	7BK	Models 49-1076 Code 123 49-1077 Code 122 49-1175 Code 122 49-1175 Code 124 49-1278 Code 123 49-1279 Code 122 49-1280 Code 121
V28	FM Converter	14F8	14F8	8BW	
V29	AM Converter	12AU7	12AU7	9A	
V30	1st IF Amp.	6BJ6	6BJ6	7CM	
V31	2nd IF Amp.	6BJ6	6BJ6	7CM	
V32	Ratio Det. -Det. - AVC-AF Amp.	19T8	19T8	9E	
V33	Power Output	50C6G	50C6G	7AC	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C107A	40	250	30-2568-24	AF8842G		D-13307	▪ Filter
B	40	300					■ Filter
C	20	300					▲ Filter
D	10	300					Decoupling
C108	40	200	30-2568-28	AFN8E		TVL-3	Voltage Doubler Cap.
C109	2	50	30-2417-7	E26E6		TVA-12	Stabilizing Cap.
C110	100		62-110009001	GP100M	GP1K-100	1FM-31	Ant. Coupling
C111	100		62-110009001	GP100M	GP1K-100	1FM-31	Ant. Coupling
C112	51		30-1224-2	GP51M	GP1K-50	1FM-45	RF Coupling
C113	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Cathode Bypass
C114	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Bypass
C115	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Screen Bypass
C116	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Filament Bypass
C117	51		62-051209021	GP51M	GP1K-100	1FM-45	RF Coupling
C118	220		62-122001001	GP220M	GP2K-220	1FM-325	RF Coupling *
C119	.03	400	61-0119	P488-03		TM-13	RF Bypass ‡
C120	100		62-110009001	GP100M	GP1K-100	1FM-31	Mixer Cathode Bypass
C121	51		62-051209021	GP51M	GP1K-51	1FM-45	Osc. Grid Cap.
C122	220		62-122001001	GP220M	GP2K-220	1FM-325	Osc. Feedback
C123	220		62-122001001	GP220M	GP2K-220	1FM-325	Osc. Feedback
C124	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	Osc, Plate Decoupling
C125	100		62-110009001	GP100M	GP1K-100	1FM-31	FM Conv. Fil. Bypass
C126	100		62-110009001	GP100M	GP1K-100	1FM-31	FM Conv. Fil. Bypass
C127	10		62-010009001	CN10DNPO	GP1K-10	MS-41	Fixed Trimmer
C128	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Coupling
C129	1500		62-215001011	GP1500M	GP2L-0015	1FM-215	AM Conv. Cath. Bypass
C130	220		62-122001001	GP220M	GP2K-220	1FM-325	Osc. Grid Cap.
C131	100		62-110009001	GP100M	GP1K-100	1FM-31	Osc. Feedback
C132	.01	400	61-0120	P488-01	821-01	TM-11	Tuning Cap. Isolation
C133	1500		62-215001011	GP1500M	GP2L-0015	1FM-315	RF Bypass
C134	.01	600	61-0120	P688-01	821-01	TM-11	FM Conv. Decoupling
C135	.01	600	61-0120	P688-01	821-01	TM-11	AM Conv. Decoupling
C136	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Bypass
C137	.01	400	61-0120	P488-01	821-01	TM-11	AVC Filter
C138	.01	400	61-0120	P488-01	821-01	TM-11	AVC Filter
C139	.01	400	61-0120	P488-01	821-01	TM-11	Filament Bypass †
C140	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Bypass
C141	.05	400	61-0122	P488-05		TM-15	RF Bypass
C142	.01	400	61-0120	P488-01	821-01	TM-11	Filament Bypass
C143	.004	600	61-0179	P688-004	811-005	TM-24	1st IF Decoupling
C144	.01	400	61-0120	P488-01	821-01	TM-11	2nd IF Cath. Bypass
C145	.01	400	61-0120	P488-01	821-01	TM-11	2nd IF Screen Bypass
C146	.01	600	61-0120	P688-01	821-01	TM-11	2nd IF Plate Decoupling
C147	100		62-110009001	GP100M	GP1K-100	1FM-31	2nd IF Plate Decoupling
C148	.01	400	61-0120	P488-01	821-01	TM-11	RF Bypass †
C149	.01	400	61-0120	P488-01	821-01	TM-11	Diode Load Cap.
C150	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Bypass
C151	2700	500	60-20275404	1467-0025	GP2M-0027	1FM-23	De-emphasis
C152	2.2		30-1221-4				Fixed Trimmer †
C153	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Bypass
C154	.01	400	61-0120	P488-01	821-01	TM-11	RF Bypass
C155	.03	400	45-3500-1	P488-03		TM-13	Line Isolation
C156	.05	400	61-0170	P488-05 §		72P51	Line Isolation
C157	.02	400	61-0108	P488-02		TM-12	Audio Coupling
C158	.006	400	45-3500-7	P488-006	GP2M-0056	TM-26	Tone Compensation
C159	.006	400	45-3500-7	P488-006	GP2M-0056	TM-26	Tone Compensation
C160	.006	400	45-3500-7	P488-006	GP2M-0056	TM-26	Audio Coupling
C161	51		30-1224-2	GP51M	GP1K-50	1FM-45	AF Amp. Grid Bypass †
C162	100		62-110009001	GP100M	GP1K-100	1FM-31	AF Amp. Plate Bypass
C163	.006	400	45-3500-7	P488-006	GP2M-0056	TM-26	Audio Coupling
C164	100		62-110009001	GP100M	GP1K-100	1FM-31	Output Grid Bypass
C165	220		62-122001001	GP220M	GP2K-220	1FM-325	Output Cath. Bypass †
C166	.006	600	45-3500-7	P688-006		TM-26	Output Plate Bypass
C167	100		62-110009001	GP100M	GP1K-100	1FM-31	RF Bypass
C168	.04	400	45-3500-2	P488-04		TM-14	Line Filter
C169	.1	400		P488-1		TM-1	Phono Isolation
C170	100			GP100M	GP1K-100	1FM-31	Filament Bypass
C171	100			GP100M	GP1K-100	1FM-31	Filament Bypass †
C172	100			GP100M	GP1K-100	1FM-31	Filament Bypass †
C173	100			GP100M	GP1K-100	1FM-31	RF Bypass †
C174	100			GP100M	GP1K-100	1FM-31	FM Conv. Plate Decoupling †

* Some models use 100MMF in this application.
† Not used in all models.
‡ Some models use .02MFD in this application.
§ Wind 11 turns hook-up wire on replacement capacitor and replace in circuit as per original.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R141	2 Meg.	½	33-5535-17	Q18-139X	T-116	Volume control, tapped at 1 Meg.
R142	4 Meg.	½	33-5538-34			Tone control and switch

RADIO **PARTS LIST AND DESCRIPTIONS (Continued)**

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	
R143	1 Meg.	$\frac{1}{2}$	66-5108340	BTS-1 Meg.	FM RF Grid
R144	100Ω	$\frac{1}{2}$	66-1108340		FM RF Cathode
R145	15KΩ	$\frac{1}{2}$	66-3158340	BTS-15K	FM RF Screen
R146	10KΩ	$\frac{1}{2}$	66-3108340	BTS-10K	FM Conv. Grid
R147	1500Ω	$\frac{1}{2}$	66-2158340	BTS-1500	FM Conv. Cathode
R148	15KΩ	$\frac{1}{2}$	66-3158340	BTS-15K	FM Osc. Grid
R149	10KΩ	$\frac{1}{2}$	66-3108340	BTS-10K	FM Osc. Plate Decoupling-See Note 16
R150	68Ω	$\frac{1}{2}$	66-0688340	BW-$\frac{1}{2}$-68	Bias Network
R151	1 Meg.	$\frac{1}{2}$	66-5108340	BTS-1 Meg.	AM Conv. Grid
R152	1500Ω	$\frac{1}{2}$	66-2158340	BTS-1500	AM Conv. Cathode-See Note 17
R153	15KΩ	$\frac{1}{2}$	66-3158340	BTS-15K	AM Osc. Grid
R154	33KΩ	$\frac{1}{2}$	66-3338340	BTS-33K	AM Osc. Plate-See Note 17
R155	10KΩ	$\frac{1}{2}$	66-3108340	BTS-10K	FM Conv. Plate Decoupling
R156	10KΩ	$\frac{1}{2}$	66-3108340	BTS-10K	AM Conv. Plate Decoupling-See Note 16
R157	1 Meg.	$\frac{1}{2}$	66-5108340	BTS-1 Meg.	AVC Network
R158	47Ω	$\frac{1}{2}$	66-0478340		1st IF Cathode
R159	1000Ω	$\frac{1}{2}$	66-2108340	BTS-1000	1st IF Decoupling
R160	3.3 Meg.	$\frac{1}{2}$	66-5338340	BTS-3.3 Meg.	AVC Network
R161	68Ω	$\frac{1}{2}$	66-0688340		2nd IF Cathode
R1621	10KΩ	$\frac{1}{2}$	66-3108340	BTS-10K	2nd IF Screen-See Note 16
R163	1000Ω	$\frac{1}{2}$	66-2108340	BTS-1000	2nd IF Plate Decoupling
R164	330KΩ	$\frac{1}{2}$	66-4338340	BTS-330K	Diode Load
R165	47KΩ	$\frac{1}{2}$	66-3478340	BTS-47K	Diode Filter
R166	47KΩ	$\frac{1}{2}$	66-3478340	BTS-47K	De-emphasis
R167	100KΩ	$\frac{1}{2}$	66-4108340	BTS-100K	AVC Network
R168	47KΩ	$\frac{1}{2}$	66-3478340	BTS-47K	Ratio Det. Diode Load
R169	47KΩ	$\frac{1}{2}$	66-3478340	BTS-47K	Tone Compensation
R170	10 Meg.	$\frac{1}{2}$	66-6108340	BTS-10 Meg.	AF Grid
R171	270KΩ	$\frac{1}{2}$	66-4278340	BTS-270K	AF Plate
R172	470KΩ	$\frac{1}{2}$	66-4478340	BTS-470K	Output Grid
R173	220Ω	2	66-1228340	BW-2-220	Output Cathode
R174	10KΩ	1	66-3104340	BTA-10K	Decoupling-See Note 18
R175A	180Ω	10	33-3435-23		Filter, Wire Wound-See Note 19
B	3180Ω	10			Filter, Wire Wound-See Note 19
R176	50Ω	7	33-1335-84		Surge Limiter, Wire Wound-See Note 20
R177	68Ω	$\frac{1}{2}$	66-0688340	BW-$\frac{1}{2}$-68	Bias Network

Note 16. Changed from 4700Ω to 10KΩ in models 49-1076, 49-1278 Code 123, 49-1077, 49-1279, Code 122 and 49-1280 Code 121, run 6.
Note 17. Changed from 2200Ω to 1500Ω in models listed in note 16 run 3
Note 18. Changed from 220Ω to 10KΩ in models listed in note 16, run 9.
Note 19. Changed from two sections of 180Ω, and 2500Ω to two sections of 180Ω and 3180Ω in models listed in note 16, run 12.
Note 20. Changed from 25Ω to 50Ω in models listed in note 16, run 4.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T9	2.7KΩ	3.7Ω	188Ω	.4Ω	32-8367	A-3849	A-2902	RO-305	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	
L34	AM Loop Ant.	0Ω		32-4273-1		
L35	FM Ant.	0Ω		32-4158-1		
L36	RF Choke	.5Ω		32-4061-2		
L37	FM RF	0Ω		32-4159-1		
L38	RF Choke	.5Ω		32-4061-2		
L39	RF Choke	.5Ω		32-4061-2		
L40	RF Choke	.5Ω				
L41	FM Osc.	0Ω		32-4018-5		
L42	AM Ant. Loading	1Ω		32-4217-1		
L43	FM RF Isolation	.5Ω		32-4061-2		
L44	AM Osc.	1Ω		32-4221-1	14-1060	
L45	RF Choke	.5Ω		32-4061-2		
L46	FM 1st IF	1Ω	1.2Ω	32-4257		
L47	AM 1 st IF	23Ω	20Ω	32-4258		
L48	FM 2nd IF	1Ω	1Ω	32-4257-1		
L49	AM 2nd IF	0Ω	9.8Ω	32-4160-3	16-6678	
L50	Ratio Det. Trans.	1.5Ω	.1Ω	32-4261		
L51	3rd AM IF	14.5Ω	14.5Ω	32-4240-1	16-6678	
L52	Fil. Choke	1.5Ω		32-4143-4		
L53	RF Choke	.5Ω		32-4061-2		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					PHILCO PART No.		
M7	Bayonet	6-8	.15	Brown	34-2068		Type #47
M8	Screw	120V			34-2605		Type 120V, 7W
M9	Screw	120V			34-2605		Type 120V, 7W

M8 and M9 not used in all models, 49-1040 Code 123. 49-1150 Code'122. 49-1240 Code 124, 49-1150 Code 124

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	PHILCO PART No.	SYLVANIA PART No.		
M10	.105A	34-8003-2	ND-5		
M11	.105A	34-8003-2	ND-5		

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA					REMARKS
	PHILCO PART No.	ASTATIC PART No.		SHURE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M12	35-2671-1	LT2-M	T(M)	W61B	A62A	
M13	45-1609	U-J	U(J)			

MISCELLANEOUS

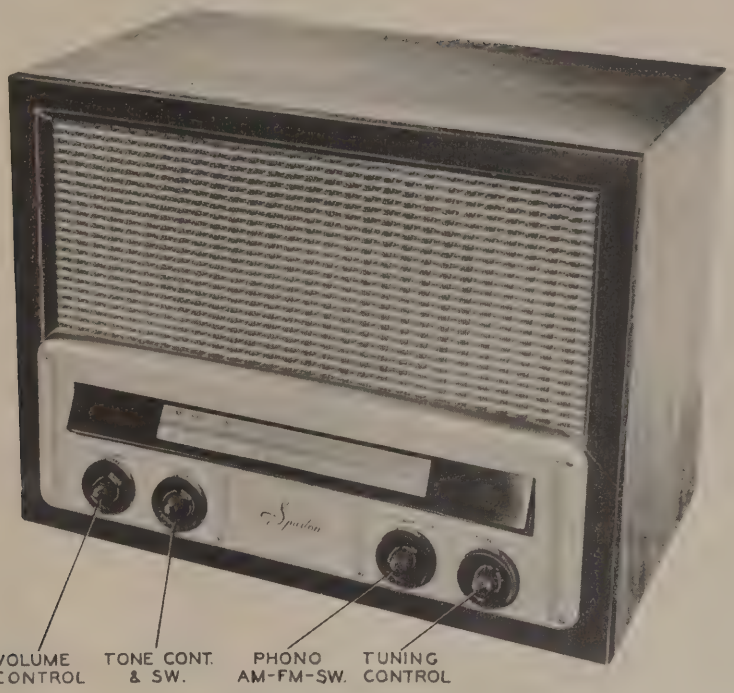
ITEM No.	PART NAME	PHILCO PART No.	NOTES
M14	STD-LP Switch		
M15	Tuning Cap.	31-2724-7	(23-522MMF) (10-247MMF) W/T
M16	Switch	42-1874	FM-AM-Phono

BLOCK DIAGRAM

DIAL CORD STRINGING

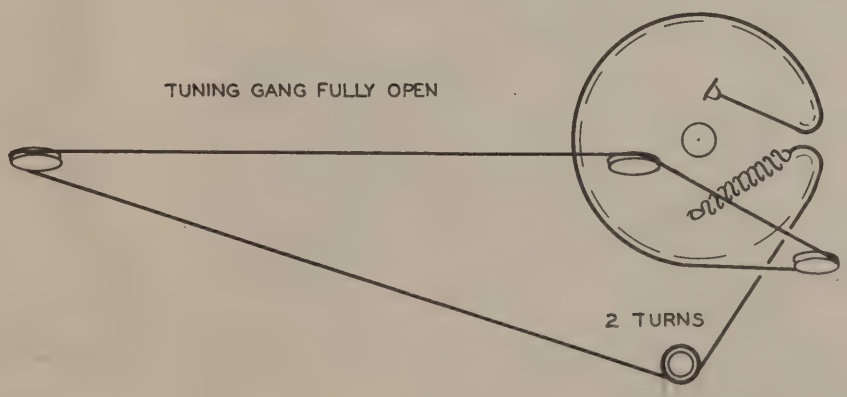
SPARTON MODELS 141A, (Ch. 8L10), 4970, 4971, 4972, (Ch. 8S10)

SPARTON MODELS 141A, (Ch. 8L10), 4970, 4971, 4972, (Ch. 8S10)



SPARTON MODEL 141A

TRADE NAME	Sparton Models 141A (Ch: 8L10), 4970, 4971, 4972 (Ch. 8S10)
MANUFACTURER	Sparks-Withington Co., Jackson, Michigan
TYPE SET	AC Operated AM-FM Superheterodyne Receiver with Loop Antenna
TUBES(EIGHT)	Types 12AT7 FM RF Amp.-FM Mixer, 6BE6 FM Osc.-AM Converter, 6BA6 1st IF Amp., 6BA6 FM 2nd IF Amp., 6AL5 Ratio Det., 6AV6 DET-AVC-AF, 6V6GT Power Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC — RATING .55 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	540-1610KC — FREQ. MOD. 88-108MC



DIAL CORD DRIVE

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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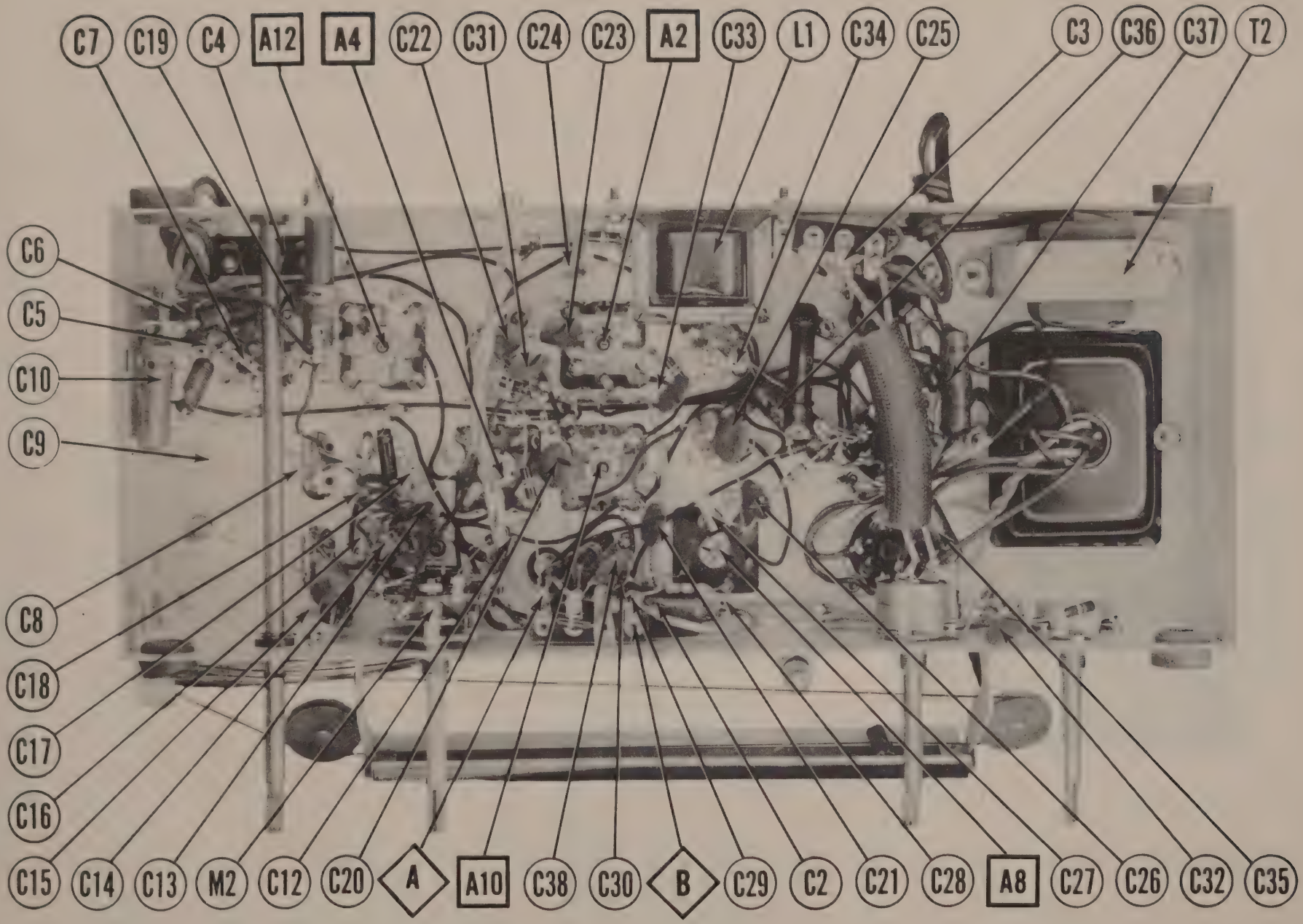
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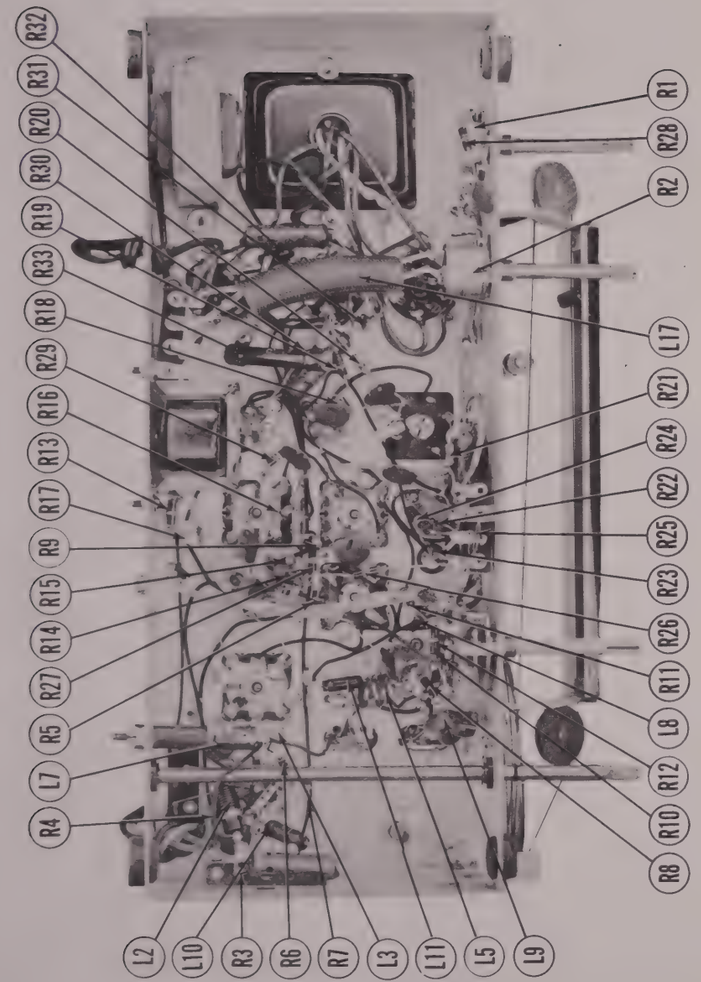

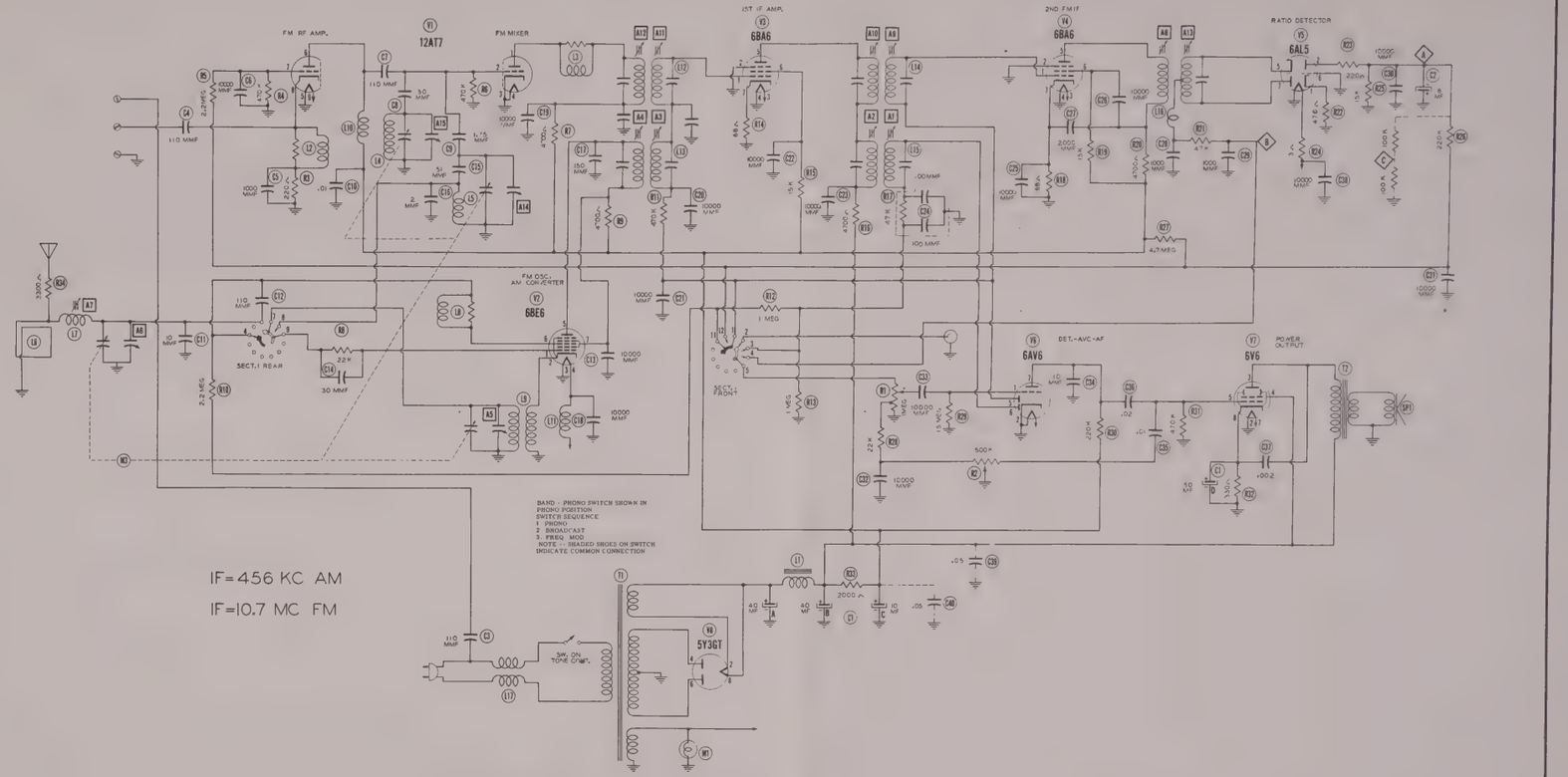

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
† V1	12AT7	125VDC	-.8VDC	0V.	0V.	0V.	155VDC	0V.	1.3VDC	6.3VAC
† V2	6BE6	8-3VDC	0V.	0V.	6.3VAC	100VDC	100VDC	-.7VDC		
V3	6BA6	8-7.5VDC	0V.	0V.	6.3VAC	100VDC	100VDC	-.2VDC		
V4	6BA6	-.2VDC	0V.	6.3VAC	0V.	100VDC	100VDC	.7VDC		
† V5	6AL5	-.1VDC	0V.	6.3VAC	0V.	158VDC	155VDC	.5VDC		
† V5	6AL5	.1VDC	-.5VDC	5.8VAC	0V.	-.3VDC	0V.	-.1VDC		
V6	6AV6	-.5VDC	0V.	6.3VAC	0V.	-.6VDC	-.6VDC	83VDC		
V7	6V6GT	0V.	0V.	315VDC	325VDC	0V.	310VDC	8.3VAC	12VDC	
V8	5Y3GT	0V.	250VDC	0V.	250VAC	0V.	250VAC	0V.	250VDC	

† TAKEN WITH VACUUM TUBE VOLTMETER.
† TAKEN IN " FM " POSITION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
† V1	12AT7	17KΩ	470Ω	0Ω	0Ω	0Ω	12.5KΩ	470Ω	220Ω	3Ω
V2	6BE6	22KΩ	1Ω	0Ω	3Ω	17KΩ	17KΩ	4 Meg.		
V3	6BA6	2 Meg.	0Ω	3Ω	0Ω	12KΩ	115KΩ	58Ω		
† V4	6BA6	200KΩ	0Ω	3Ω	0Ω	17KΩ	117KΩ	58Ω		
† V5	6AL5	470Ω	15KΩ	3Ω	0Ω	1 Meg.	0Ω	1 Meg.		
V6	6AV6	15 Meg.	0Ω	3Ω	0Ω	500KΩ	1.5 Meg.	1220KΩ		
V7	6V6GT	0Ω	0Ω	1700Ω	1300Ω	470KΩ	12.4KΩ	3Ω	330Ω	
V8	5Y3GT	0Ω	200KΩ	Inf.	90Ω	Inf.	85Ω	Inf.	200KΩ	

† MEASURED FROM PIN 8 OF V6.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PARTS LIST AND DESCRIPTIONS
TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SPARTON PART No.	STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	FM RF Amp. - FM Mixer	12AT7	12AT7	9A	
	FM Osc. - AM Converter	6BE6	6BE6	7CH	
V2	1st IF Amplifier	6BA6	6BA6	7BK	
V3	2nd IF Amplifier	6BA6	6BA6	7BK	
V4	Ratio Detector	6AL5	6AL5	6BT	
V5	1st Audio - AVC	6AV6	6AV6T	7AC	
V6	Power Output	6V6GT	6V6GT	5T	
V8	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SPARTON PART No.	AEROVOX PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	PA4307-4	AVP8842Q20B		TVL-30	■ Filter - See note 1.
B	10	300					▲ Filter
C	10	300					Output Cathode Bypass
D	40	450	PA4307-3	AVP8824A		81L-424 ●	Mixer Grid #2
C1A	40	450					▲ Filter
B	40	450					Output Cathode Bypass
C1C	8	450	PA4303-4	PR8450/8		UT-8	Mixer Grid #2
C2	8	50	PA4303-7	PR8570/8		7A-510	Stabilizing Capacitor
C3	1000		CC30B-102K	GP20B2M	GP2K-120	1FM-31	FM RF Cathode Bypass
C4	110		CC30B-111A	GP1203M	GP2K-120	1FM-31	Antenna Coupling
C5	1000		BK35C-102	GP10003M	GP2L-001	1FM-31	FM RF Cathode Bypass
C6	10000		CC30B-103Z	GP10203M	GP2K-120	1FM-31	RF Coupling
C7	110		CC30B-111A	GP1203M	GP2K-120	1FM-31	RF Coupling
C8	30		CC30B-300K	GP30E	GP1K-33	MS-43	RF Coupling - See note 3.
C9	7.5		CC30B-7R5D				1st IF Plate Coupling - See note 4.
C10	.01	400	PC4081-103	P488-01		82L-01	Decoupling
C11	10	500	MC40F-1000S	1488-40005		MS-41	Fixed Trimmer
C12	10	450	PA4307-1	P488-10		1FM-31	Fixed Trimmer
C13	10000		PA4324-2	BPD-10		82L-01	Converter Decoupling
C14	50		CC30H-500K	GP50K		MS-43	Oscillator Grid Capacitor
C15	1000		CC30B-102K	GP10203MPQ		MS-315	Fixed Trimmer
C16	2		CC30H-020K	CN2CN750		N750K-2	Fixed Trimmer
C17	1000		CC30A-102F	CN10J2N470		M47U-150	Fixed Trimmer Bypass
C18	10000		PA4324-2	BPD-10		82L-01	Mixer Plate Decoupling
C19	10000		PA4324-2	BPD-10		82L-01	AVC Filter
C20	10000		PA4324-2	BPD-10		82L-01	AVC Filter
C21	10000		PA4324-2	BPD-10		82L-01	1st IF Screen Bypass
C22	10000		PA4324-2	BPD-10		82L-01	1st IF Plate Bypass
C23	10000		PA4324-2	BPD-10		82L-01	1st IF Plate Bypass
C24A	100			GP100M	GP1K-100	82L-31	Diode RF Filter
B	100			GP100M	GP1K-100	1FM-31	Diode RF Filter
C25	10000		PA4324-2	BPD-10	82L-01	2nd IF Cathode Bypass	
C26	10000		PA4324-2	BPD-10	82L-01	2nd IF Cathode Bypass	
C27	3000		BK35C-202	GP30003M	GP2M-002	1FM-23	2nd IF Plate Decoupling
C28	3000		BK35C-202	GP30003M	GP2M-002	1FM-23	Diode Load Capacitor
C29	1000		BK35C-102	GP10003M	GP2L-001	1FM-21	Diode Load
C30	10000		PA4324-2	BPD-10		82L-01	RF Bypass
C31	10000		PA4324-2	BPD-10		82L-01	Output Coupling
C32	10000		PA4324-2	BPD-10		82L-01	Tone Compensation
C33	10000		PA4324-2	BPD-10		82L-01	Audio Coupling
C34A	1	400	PC4081-1A	P488-02		1FM-21	Tone Compensation Plate Bypass
B	1.5	400	PC4081-103	P488-01		TM-12	Tone Compensation
C35	.01	400	PC4081-203	P488-02		MS-32	Audio Coupling
C36	10000	400	PC4081-502	P488-03		TM-12	AVC Filter Bypass
C37	.05	600	PC40M-503	P488-05		TM-15	Filament Bypass
C38	.05	600	PC40M-503	P488-05		TM-15	RF Bypass - See note 2.
C39	10000		PA4324-2	BPD-10		82L-01	RF Bypass - See note 2.

NOTE 1 - Used only in chassis 8100.
NOTE 2 - Used only in chassis 8200.
NOTE 3 - Chassis 8200 uses 30MMF in this application (Mfgrs. Part No. CC30B-300K).
NOTE 4 - Chassis 8200 uses 3MMF in this application (Mfgrs. Part No. CC30A-020K).
● Items C34A, C34B and R17 are combined into one unit, obtainable under Mfgrs. Part No. PA4329-1.
▲ Parallel sections to obtain desired capacity.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	PA4408-2	Q1B-137X	A7-103	Volume Control - Tapped at 100KΩ
B	Shaft		Not Req.	Not Req.	RSB-3	Attach to R1A per instructions.
R2A	1 Meg.	½	PA4408-10	Q1B-133	A7-103-Z	Volume Control - Tapped at 400KΩ
B	Shaft		Not Req.	Not Req.	RSB-3	Attach to R2A per instructions.
C	Switch		Not Req.	78-1	SW-A	Attach to R2A per instructions

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	IDENTIFICATION CODES
R3	2200Ω	½	BR1S-222	FM RF Cathode
R4	470KΩ	½	BR1S-474	FM RF Grid
R5	4.2 Meg.	½	BR1S-225	AVC Network
R6	4.7 Meg.	½	BR1S-475	AVC Network
R7	470KΩ	½	BR1S-474	FM Mixer Plate Decoupling
R8	22KΩ	½	BR1S-223	Oscillator Grid
R9	47KΩ	½	BR1S-473	FM Mixer Plate Decoupling
R10	2.2Meg.	½	BR1S-225	AVC Network
R11	470KΩ	½	BR1S-474	AVC Network
R12	1 Meg.	½	BR1S-105	AVC Network
R13	1 Meg.	½	BR1S-105	1st IF Grid
R14	68Ω	½	BR1S-680	1st IF Cathode
R15	15KΩ	½	BR1S-153	1st IF Screen
R16	470KΩ	½	BR1S-474	1st IF Plate Decoupling
R17	47KΩ	½	BR1S-473	Diode Filter
R18	10Ω	½	BR1S-100	2nd FM IF Cathode
R19	1MEG	½	BR1S-105	2nd FM IF Grid
R20	47000Ω	½	BR1S-4703	2nd FM IF Plate Decoupling
R21	47KΩ	½	BR1S-473	De - emphasis
R22	47KΩ	½	BR1S-473	Limiting
R23	220Ω	½	BR1S-221	Balancing
R24	1Ω	½	PA4297-1	Ratio Detector Filament - Wire Wound
R25	150KΩ	½	BR1S-154	Ratio Detector
R26	220KΩ	½	BR1S-224	AVC Network
R27	4.7 Meg.	½	BR1S-475	Delayed AVC
R28	220KΩ	½	BR1S-224	AF Coupling
R29	15 Meg.	½	BR1S-156	AF Compensation
R30	220KΩ	½	BR1S-224	AF Amplifier Plate
R31	470KΩ	½	BR1S-474	Output Grid
R32	510Ω	½	BR1S-511	Output Cathode
R33	2000Ω	10	PA4300-10	Filter - Wire Wound
R34	1500Ω	½	BR1S-352	Antenna Loading

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 50 to 60 Cycles	340 Volts CT @ 150 Ma.	5VAC @ 3 Amp.	6.3VAC @ 2.36 A.	AB-44013-1	P-8312 *		P8E-70 *

* Drill new mounting holes and add series resistor to reduce plate voltage.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T2	6.5KΩ	4.1Ω	256Ω	44Ω	A-3849	A-3849	RO-13	

CHASSIS—TOP VIEW

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial indicator, turn tuning gang fully closed and set the indicator even with the last reference mark at the low frequency end of the dial scale.

AM ALIGNMENT

Loop should be maintained in the same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01 MFD.	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	456KC (400% Mod.)	AM (Center position)	Tuning gang fully open	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1500KC	"	1500KC	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	600KC	"	600KC	"	A7	Adjust for maximum output. Repeat steps 2 and 3 until no further improvement can be made.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (A) to chassis. The junction of these two resistors is alignment point C as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.02 MFD	High side to pin 1 (grid) of 6BA6 (V3). Low side to chassis.	10.7MC (Unmod.)	FM (Clockwise)	Tuning gang fully open	DC Probe to point (A). Common to chassis.	A8, A9 A10	Adjust for maximum deflection.
5.	.02 MFD	High side to pin 2 (grid) of 12AT7 (V1). Low side to chassis.	"	"	"	"	A11, A12	"
6.	.02 MFD.	"	"	"	"	DC Probe to point (B). Common to point (C)	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 80% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.02 MFD	High side to pin 1 (grid) of 6BA6 (V3). Low side to chassis.	10.7MC	FM	Point of non-interference.	Vert. Amp. to point (A). Low side to chassis.	A8, A9, A10	Disconnect stabilizer capacitor C2. Adjust for maximum amplitude and symmetry as per figure 1.
5.	.02 MFD	High side to pin 2 (grid) of 12AT7 (V1). Low side to chassis	"	"	"	"	A11, A12	"
6.	.02 MFD	"	"	"	"	"	A13	Reconnect stabilizer cap. C2. Adjust A13 so 10.7MC marker occrs at center of crossover lines as per figure 2. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

The signal generator output lead should terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω resistors on each lead.	106MC (Unmod)	FM	106MC	DC Probe to point (A). Common to chassis.	A14, A15	Adjust for maximum deflection.

FIG. 1

FIG. 2

PARTS LIST AND DESCRIPTIONS (Continued)
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	PA4408-2	Q1B-137X	A7-103	Volume Control - Tapped at 100KΩ
B	Shaft		Not Req.	Not Req.	RSB-3	Attach to R1A per instructions.
R2A	1 Meg.	½	PA4408-10	Q1B-133	A7-103-Z	Volume Control - Tapped at 400KΩ
B	Shaft		Not Req.	Not Req.	RSB-3	Attach to R2A per instructions.
C	Switch		Not Req.	78-1	SW-A	Attach to R2A per instructions

PARTS LIST AND DESCRIPTIONS (Continued)
SPEAKER

ITEM No.	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: SPARTON PART No.	WIRING PART No.	QUAM PART No.	INSTALLATION NOTES
SP1	PM	4.1Ω	PC-63000-19	6939	69A2	
	CONE DIA.	V. C. DIA.				
SP2	6 7/8" x 9"	1"				

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE @ CURRENT (1000 cps)	REPLACEMENT DATA: SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
J1	283ADC	220Ω	5.9 Henries	AB-47004-1		C-2975		

R F COILS

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: SPARTON PART No.	MEISSNER PART No.	NOTES
L2	FM Ant. Coil	.23Ω		AA6798-3		
L3	FM Ant. Coil	0Ω		AA6798-7		
L4	FM RF Coil	0Ω		PA5300-6		
L5	FM Osc. Coil	0Ω		PA5300-7		
L6	FM Osc. Coil	0Ω		PA5300-8		
L7	Ant. Loading	2.2Ω		AA6818-1		
L8	Parasitic Supp.	0Ω		AA6798-5		
L9	Parasitic Supp.	0Ω		AA6798-5		
L10	RF Choke	0Ω		AA6798-2		
L11	Filament Choke	0Ω		AA6798-6		
L12	1st FM IF	.3Ω	50Ω	AA6681-1	18-6868	Wound on 680Ω resistor.
L13	1st AM IF	12.9Ω	12.5Ω	AA6681-1		
L14	2nd FM IF	.5Ω	1.1Ω	AA6687-3	18-6887	Wound on 220Ω resistor.
L15	2nd AM IF	12.9Ω	12.5Ω	AA6686-1		
L16	AC Line Choke	2.2Ω	1.1Ω	AA6684-1		
L17	AC Line Choke	.1Ω		AA6684-1		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	REPLACEMENT DATA: BEAD COLOR	SPARTON PART No.	STANCOR PART No.	NOTES
M1	Bayonet	6 - 8	.250	Blue	PA4100-3		Type #44

MISCELLANEOUS

ITEM No.	PART NAME	SPARTON PART No.	NOTES
M2	Switch	PA 4100	Bezel - Photo
M3	2 Gang Variable Cap.	PC 63009-1	(35 - 535MMF, 37 - 247MMF)
A14	Trimmer	PA4366	FM Oscillator Adjustment

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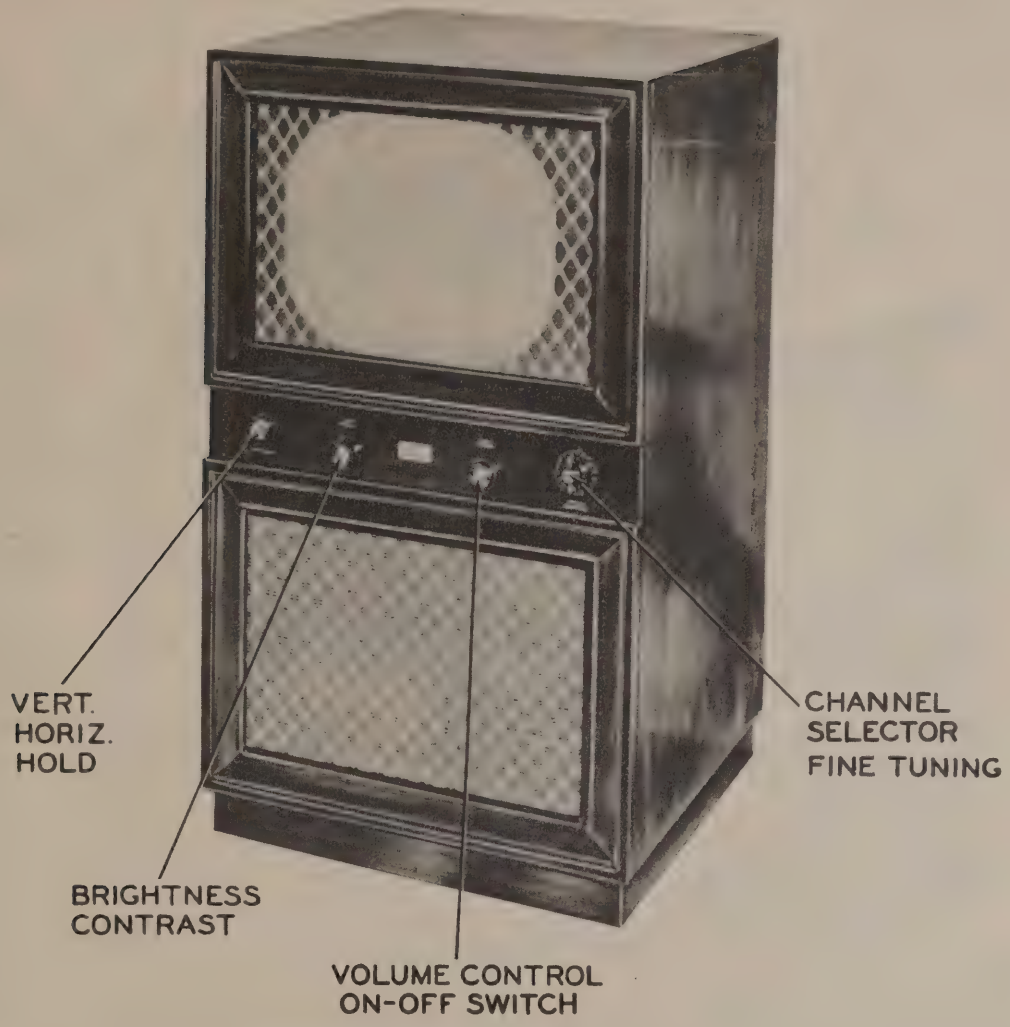

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STARRETT MODEL "HENRY PARKS"

TRADE NAME	Starrett Models "Henry Hudson","Henry Parks", "Robert E. Lee"
SUPPLIER	Starrett Television Corp., 601 W. 25th St., New York, New York
TYPE SET	Television Receiver
TUBES	Twenty Two

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 2.05 Amp. at 117 Volts AC
TUNING RANGE—Channels 2 thru 13

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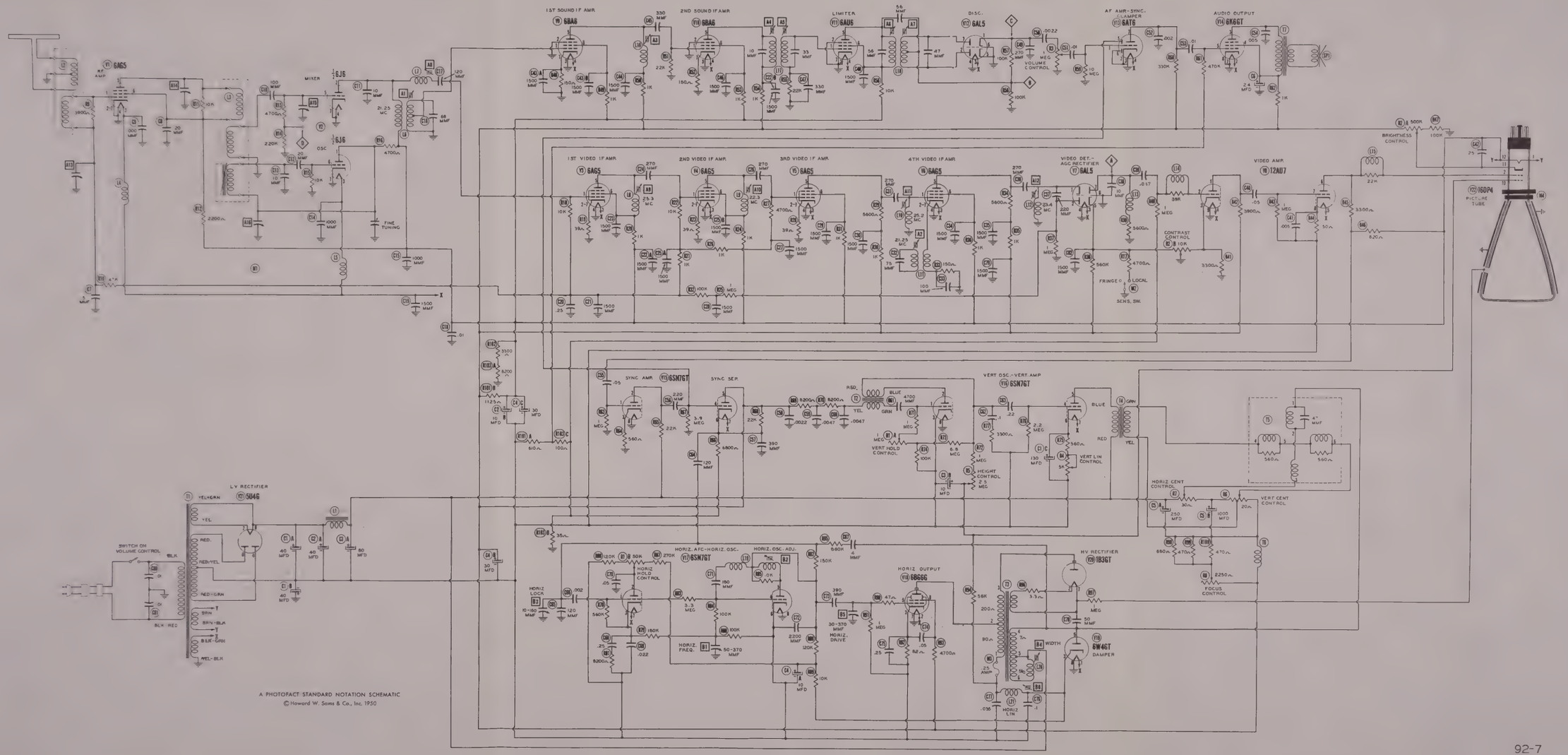

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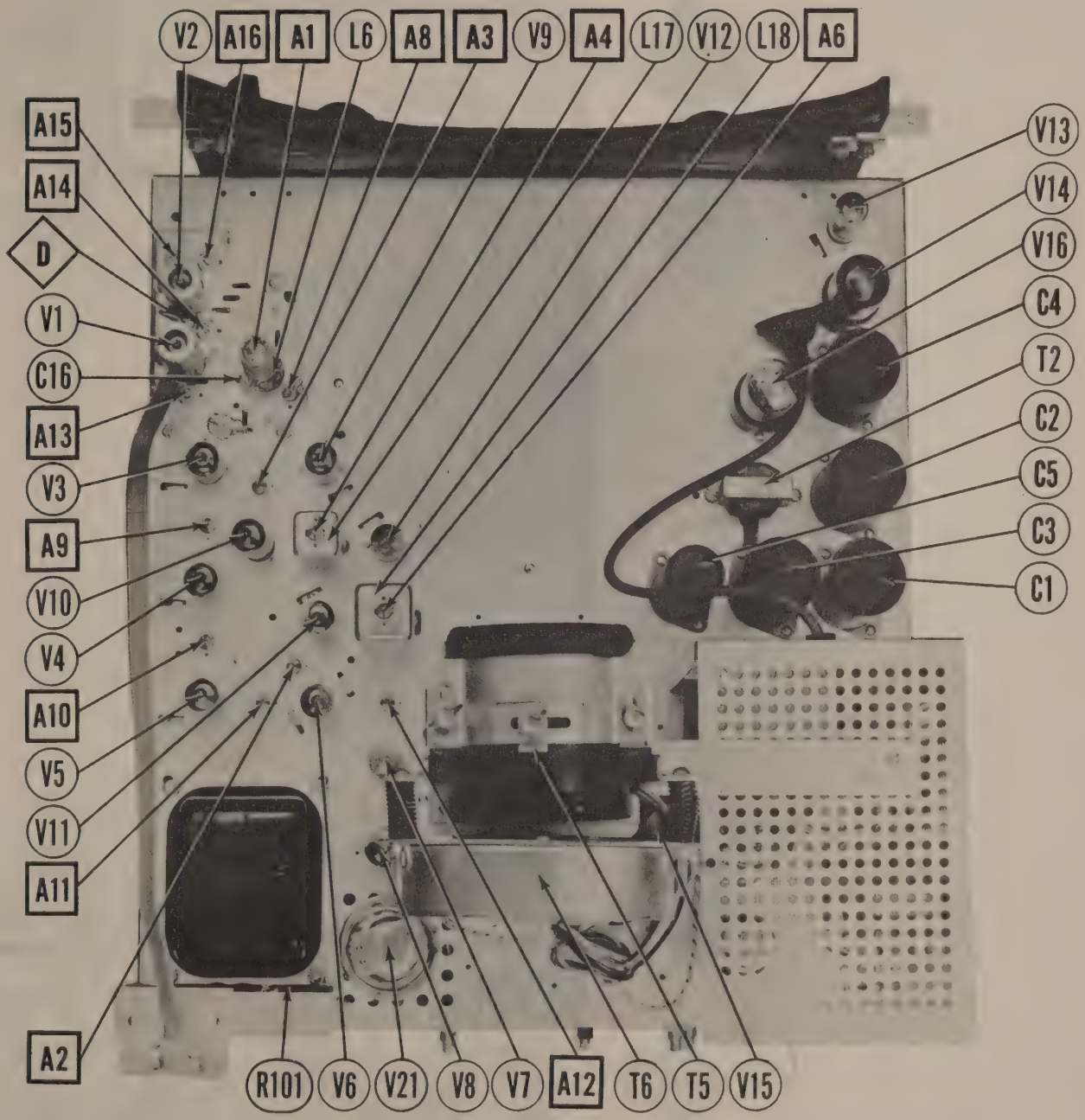
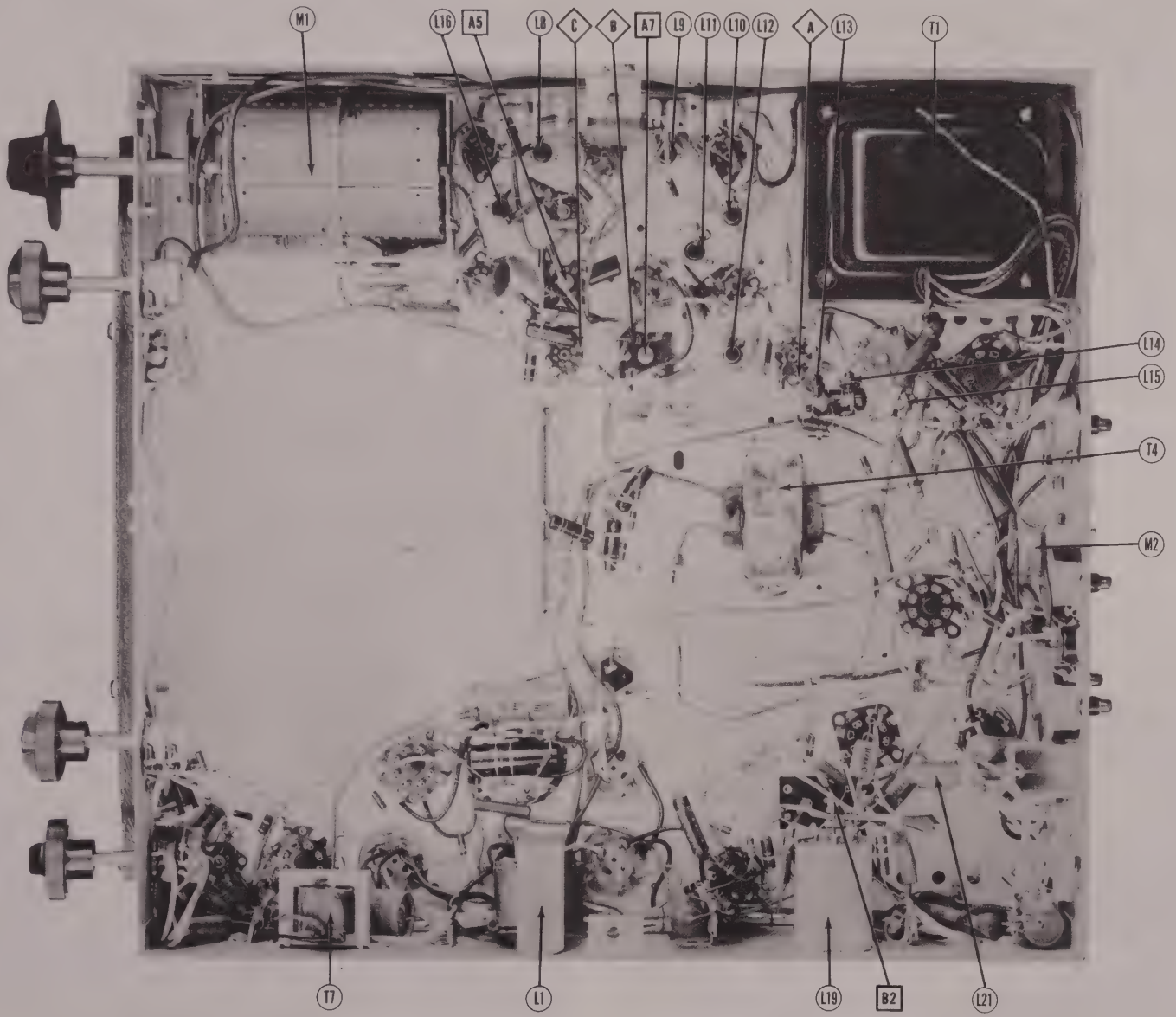
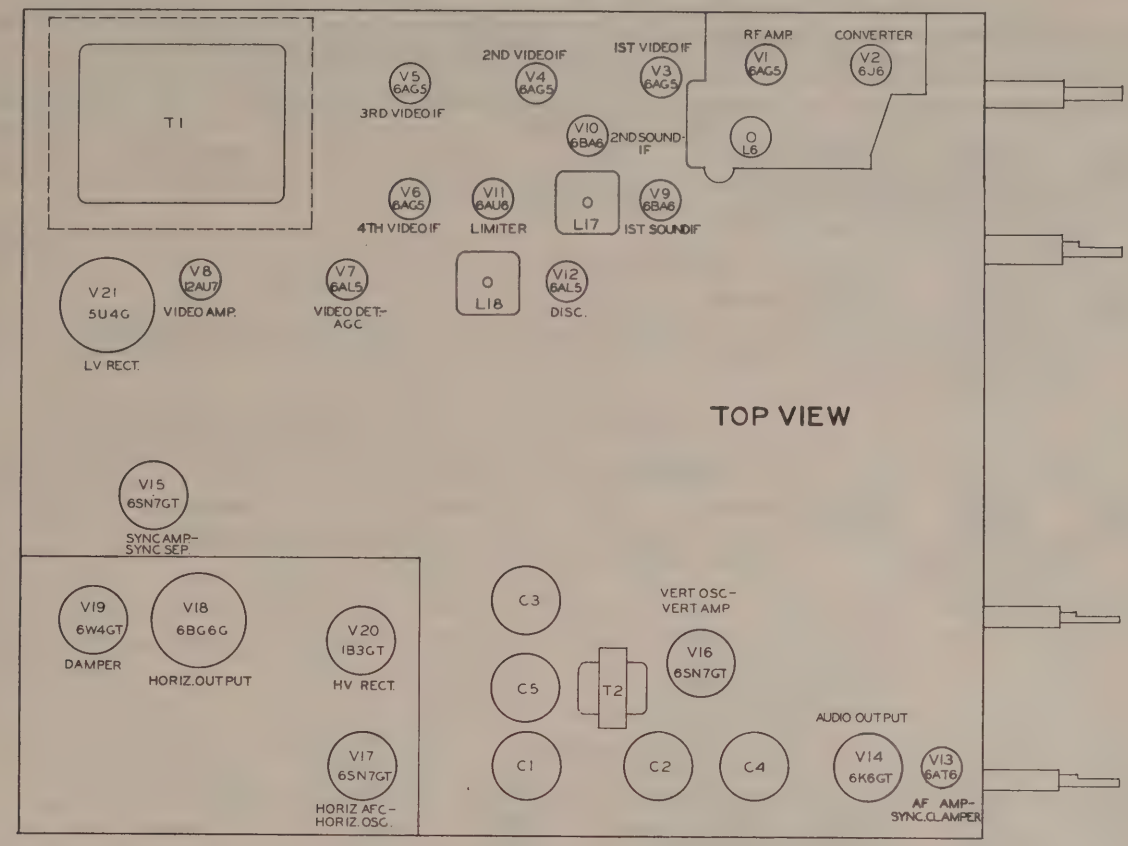
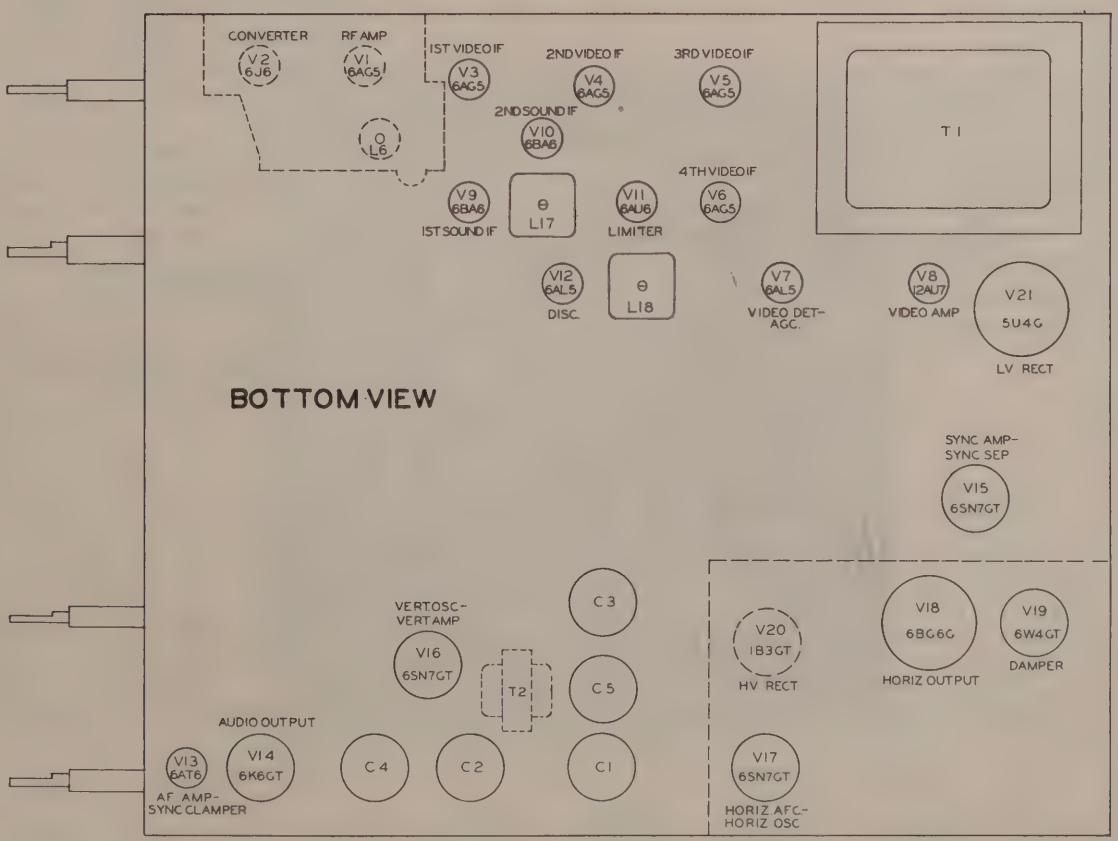


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If receiver is aligned with the picture tube removed, remove the horizontal oscillator tube V17 (6SN7GT) to eliminate the high voltage shock hazard.

The alignment procedure which follows is given in order which should be followed when complete alignment is performed.

VIDEO IF TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.		High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	21.25MC (Very accurately)	9 (If unused locally)	DC Probe to Point (A). Common to chassis.	A1, A2,	Adjust for minimum deflection.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
2.		High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	21.25MC (Very accurately)	9 (If unused locally)	DC Probe to Point (B). Common to chassis.	A3, A4, A5, A6	Adjust for maximum deflection. Attenuate signal generator to maintain a 2 volt VTVM reading.
3.	"	"	"	"	DC Probe to Point (C). Common to chassis.	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Repeat the adjustments of A6 and A7.

VIDEO IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.		High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	21.8MC	9 (If unused locally)	DC Probe to Point (A). Common to chassis.	A8	Adjust for maximum deflection.
5.		"	25.3MC	"	"	A9	"
6.		"	22.3MC	"	"	A10	"
7.		"	25.2MC	"	"	A11	"
8.		"	23.4MC	"	"	A12	"

VIDEO IF RESPONSE CHECK

Connect a 1 1/2 volt bias battery-negative to pin 2 of V7, positive to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.		High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	25MC (10MC SWP)	21.25MC 22.25MC 25.75MC	9	Vert. Amp. to Point (A). Low side to chassis.		Check response curve to see that it is similar to Fig 1. If slight retouching is necessary to reposition markers, adjust A1 and A2 until 21.25MC marker disappears. Adjust A9 and A11 to position the 25.75MC marker. Adjust A8 and A10 to position the 22.25MC marker. A12 will give the curve a flat top. Recheck the position of the 25.75 MC marker. Remove bias battery.

RF. AMP. ALIGNMENT (TUNER CL-1677)

Connect 1 1/2 volt bias battery as used in video IF alignment. Negative to pin 2 of V7, positive to chassis.
Set the fine tuning control to its midposition. This particular tuner incorporates one of two types of fine tuning control.
Those tuners having the fine tuning bakelite disc located in back of the oscillator slug and adjustment hole, the midpoint of its range is when the fine tuning shaft is turned completely counter-clockwise.
Those models having the fine tuning bakelite disc located in front of the oscillator slug adjustment hole, the midpoint of the fine tuning range is attained when the bakelite disc faces directly downward.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 125Ω carbon res.	Across antenna terminals with 125Ω resistor in each generator lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point (D). Low side to chassis.	A13, A14, A15	Adjust for flat topped response curve as per Fig 2 with markers appearing not less than 70% of maximum amplitude of the curve.
11.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check response on all channels. A13 and A14 and A15 may be adjusted slightly to obtain optimum response on all channels.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Complete alignment of the oscillator circuit may not be necessary. This is determined by checking to see that a zero reading is obtained for each channel when the fine tuning control is tuned through the midpoint of its range. (Connect signal generator and VTVM as in steps 12 and 13. Sound carrier frequencies are listed in step 13.) If the majority of the channels seem to need oscillator alignment, this sometimes may be done in one operation step 12 by adjusting A16. If should be noted that this is an all-channel adjustment and should not be adjusted for individual channels. If step 12 fails to align the oscillator circuits sufficiently, it will be necessary to adjust the oscillator coil slugs. These are accessible one channel at a time. Set the fine tuning control to the midposition of its range. (See RF Amp. Alignment for this setting.)

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	Direct	High side to one antenna terminal. Low side to chassis.	209.75MC	12	DC Prbbe to Point C. Common to chassis.	A16	Adjust for zero reading between positive and negative peaks with fine tuning control at its midpoint. Rotate channel selector switch and adjust individual channels outlined in step 13. Then repeat step 12.
13.	Direct	"	215.75MC	13	"	A17	
			209.75MC	12		A18	
			203.75MC	11		A19	
			197.75MC	10		A20	
			191.75MC	9		A21	
			185.75MC	8		A22	
			179.75MC	7		A23	
			87.75MC	6		A24	
			81.75MC	5		A25	
			71.75MC	4		A26	
			65.75MC	3		A27	
			59.75MC	2		A28	

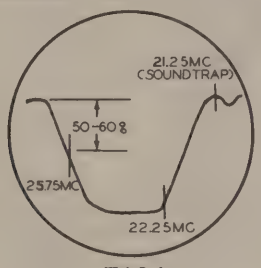


FIG.1

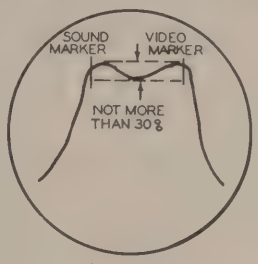
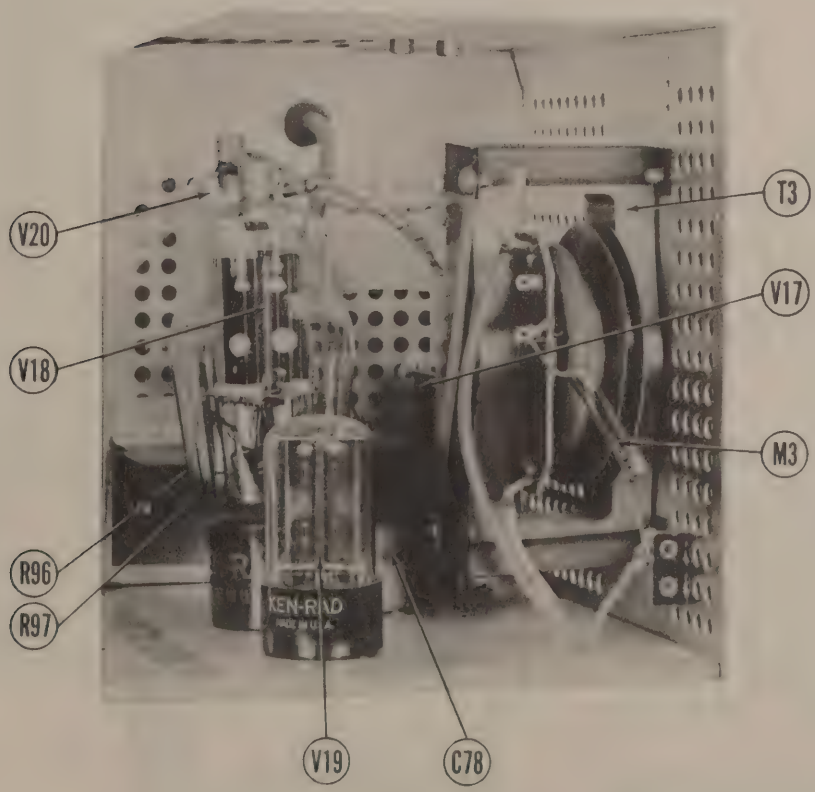


FIG.2



HIGH VOLTAGE COMPARTMENT

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.4VDC	0V.	6.3VAC	0V.	100VDC	100VDC	0V.		
V 2	6J6	75VDC	135VDC	6.3VAC	0V.	8-1.5VDC	-2VDC	0V.		
V 3	6AG5	-2.6VDC	.3VDC	6.3VAC	0V.	115VDC	115VDC	.3VDC		
V 4	6AG5	-.4VDC	.3VDC	6.3VAC	0V.	115VDC	115VDC	.3VDC		
V 5	6AG5	-.5VDC	.3VDC	6.3VAC	0V.	165VDC	115VDC	.3VDC		
V 6	6AG5	0V.	1VDC	6.3VAC	0V.	165VDC	115VDC	1VDC		
V 7	6AL5	0V.	-.1VDC	6.3VAC	0V.	3.3VDC	0V.	-1VDC		
V 8	12AU7	165VDC	-.9VDC	.1VDC	6.3VAC	6.3VAC	¶175VDC	¶-.6VDC	¶1.4VDC	0V.
V 9	6BA6	0V.	0V.	0V.	6.3VAC	200VDC	120VDC	2VDC		
V 10	6BA6	0V.	0V.	0V.	6.3VAC	200VDC	120VDC	2VDC		
V 11	6AU6	-.3VDC	0V.	0V.	6.3VAC	65VDC	65VDC	0V.		
V 12	6AL5	.1VDC	-.4VDC	6.3VAC	0V.	0V.	0V.	-.4VDC		
V 13	6AT6	-.4VDC	0V.	0V.	6.3VAC	-6.2VDC	0V.	65VDC		
V 14	6K6GT	0V.	6.3VAC	185VDC	190VDC	-5.1VDC	-18VDC	0V.	0V.	
V 15	6SN7GT	0V.	140VDC	3.7VDC	-6VDC	210VDC	2.2VDC	6.3VAC	0V.	
V 16	6SN7GT	¶-3.8VDC	¶55VDC ¶150VDC	¶0V.	¶0V.	¶340VDC	¶10VDC ¶15VDC	6.3VAC	0V.	
V 17	6SN7GT	¶-.6VDC	¶130VDC	¶12VDC	¶-45VDC	¶145VDC	¶0V.	6.3VAC	0V.	
V 18	6BG6G	0V.	6.3VAC	¶10VDC	0V.	¶0V.	¶0V.	0V.	¶250VDC	TOP CAP *
V 19	6W4GT	-95VDC	310VDC	350VDC	0V.	260VDC	0V.	6.3VAC	0V.	
V 20	1B3GT	* DO NOT MEASURE.								
V 21	5U4G	0V.	280VDC	0V.	370VAC	200VDC	370VAC	Inf.	280VDC	
V 22	16DP4	♦125VDC	¶175VDC	PIN 10 340VDC	PIN 11 33VDC	PIN 12 ♦125VDC				

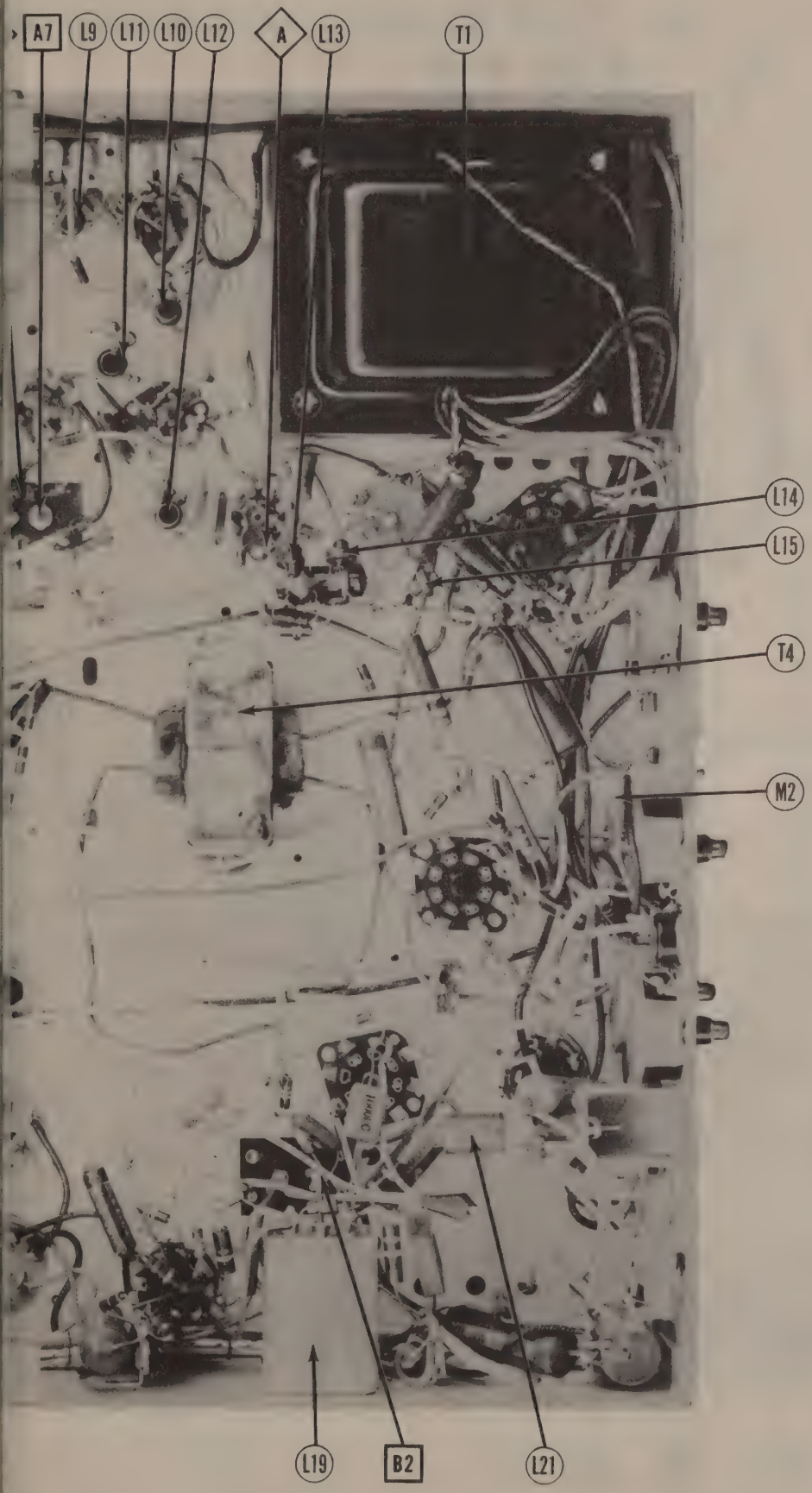
¶ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.
¶ MEASURED FROM PIN 6 OF V17.
♦ 6.3VAC MEASURED ACROSS FILAMENTS.

RESISTANCE READINGS

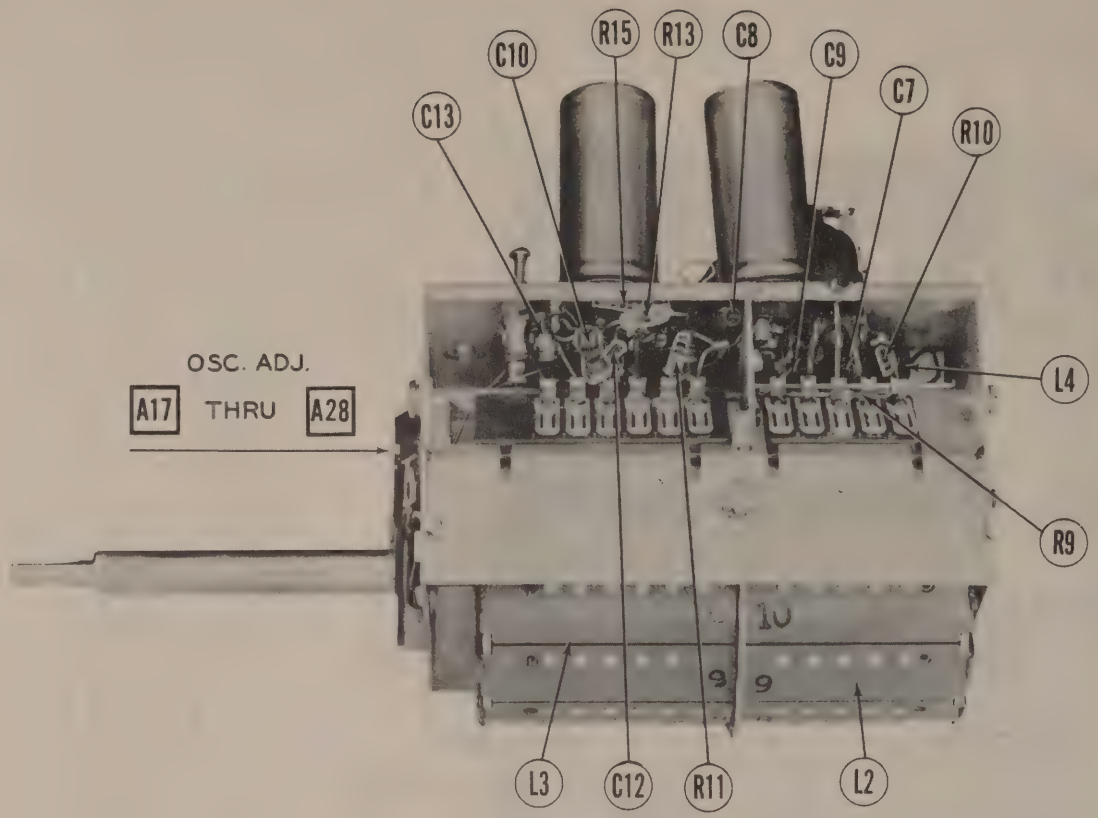
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	2 Meg.	0Ω	.1Ω	0Ω	†3.8KΩ	†3.8KΩ	0Ω		
V 2	6J6	†6KΩ	†1.5KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6AG5	2 Meg.	39Ω	.1Ω	0Ω	†2.6KΩ	†2.6KΩ	39Ω		
V 4	6AG5	2 Meg.	39Ω	.1Ω	0Ω	†2.6KΩ	†2.6KΩ	39Ω		
V 5	6AG5	2 Meg.	39Ω	.1Ω	0Ω	†8KΩ	†2.6KΩ	39Ω		
V 6	6AG5	.2Ω	150Ω	.1Ω	0Ω	†8KΩ	†2.6KΩ	150Ω		
V 7	6AL5	.2Ω	1 Meg.	.1Ω	0Ω	120Ω	0Ω	5.6KΩ		
V 8	12AU7	†4.5KΩ	1 Meg.	3.3KΩ	.1Ω	.1Ω	†5.5KΩ	1 Meg.	¶150Ω	0Ω
V 9	6BA6	0Ω	0Ω	0Ω	.1Ω	†1.5KΩ	†2.5KΩ	150Ω		
V 10	6BA6	22KΩ	0Ω	0Ω	.1Ω	†1.5KΩ	†2.5KΩ	150Ω		
V 11	6AU6	22KΩ	0Ω	0Ω	.1Ω	†12KΩ	†12KΩ	0Ω		
V 12	6AL5	200KΩ	100KΩ	.1Ω	0Ω	0Ω	0Ω	100KΩ		
V 13	6AT6	10 Meg.	0Ω	0Ω	.1Ω	3.9 Meg.	0Ω	†330KΩ		
V 14	6K6GT	Inf.	.1Ω	† 2KΩ	†1.8KΩ	470KΩ	140Ω	0Ω	0Ω	
V 15	6SN7GT	1 Meg.	†22KΩ	560Ω	3.9 Meg.	†500Ω	6.8KΩ	.1Ω	0Ω	
V 16	6SN7GT	1 Meg.	#2.5 Meg. #900KΩ	¶0Ω	2.2 Meg.	†800Ω	¶5.5KΩ ¶560Ω	.1Ω	0Ω	
V 17	6SN7GT	840KΩ	#280KΩ	280KΩ	200KΩ	#140KΩ	¶0Ω	.1Ω	0Ω	
V 18	6BG6G	Inf.	.1Ω	¶82Ω	Inf.	1 Meg.	1 Meg.	0Ω	†4.7KΩ	TOP CAP #120Ω
V 19	6W4GT	700Ω	160KΩ	160KΩ	Inf.	†65Ω	Inf.	.1Ω	0Ω	
V 20	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #300Ω
V 21	5U4G	Inf.	13KΩ	InfΩ	¶24Ω	13KΩ	¶22Ω	Inf.	13KΩ	
V 22	16DP4	†1.4KΩ	†5.5KΩ	PIN 10 #56KΩ	PIN 11 80KΩ	PIN 12 †1.4KΩ				

† MEASURED FROM PIN 8 OF V21.
# MEASURED FROM PIN 3 OF V19.
¶ MEASURED FROM PIN 6 OF V17.

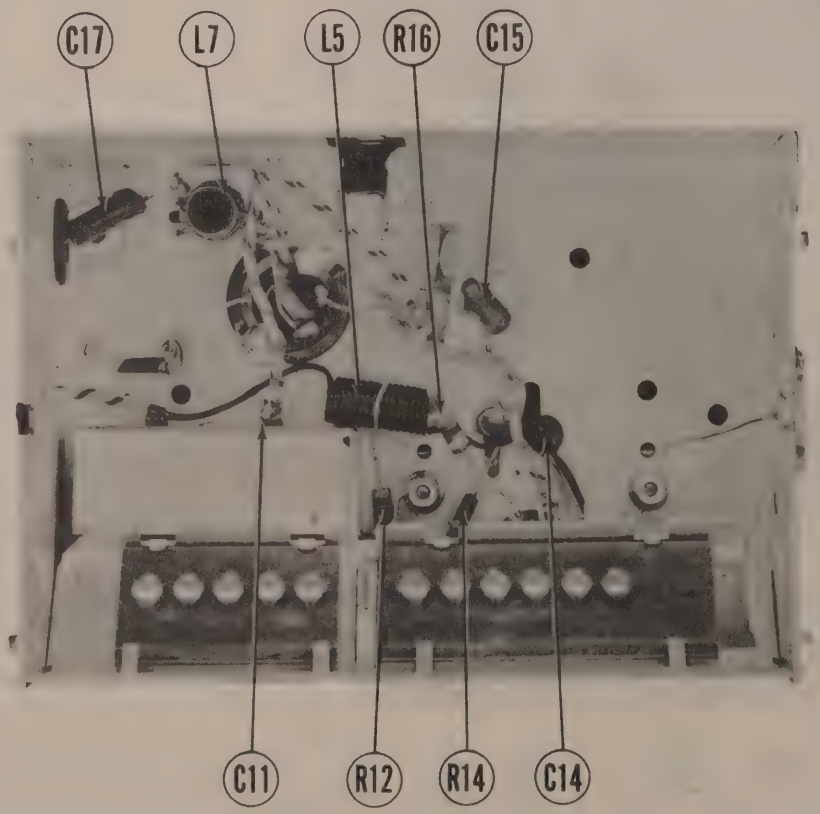
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



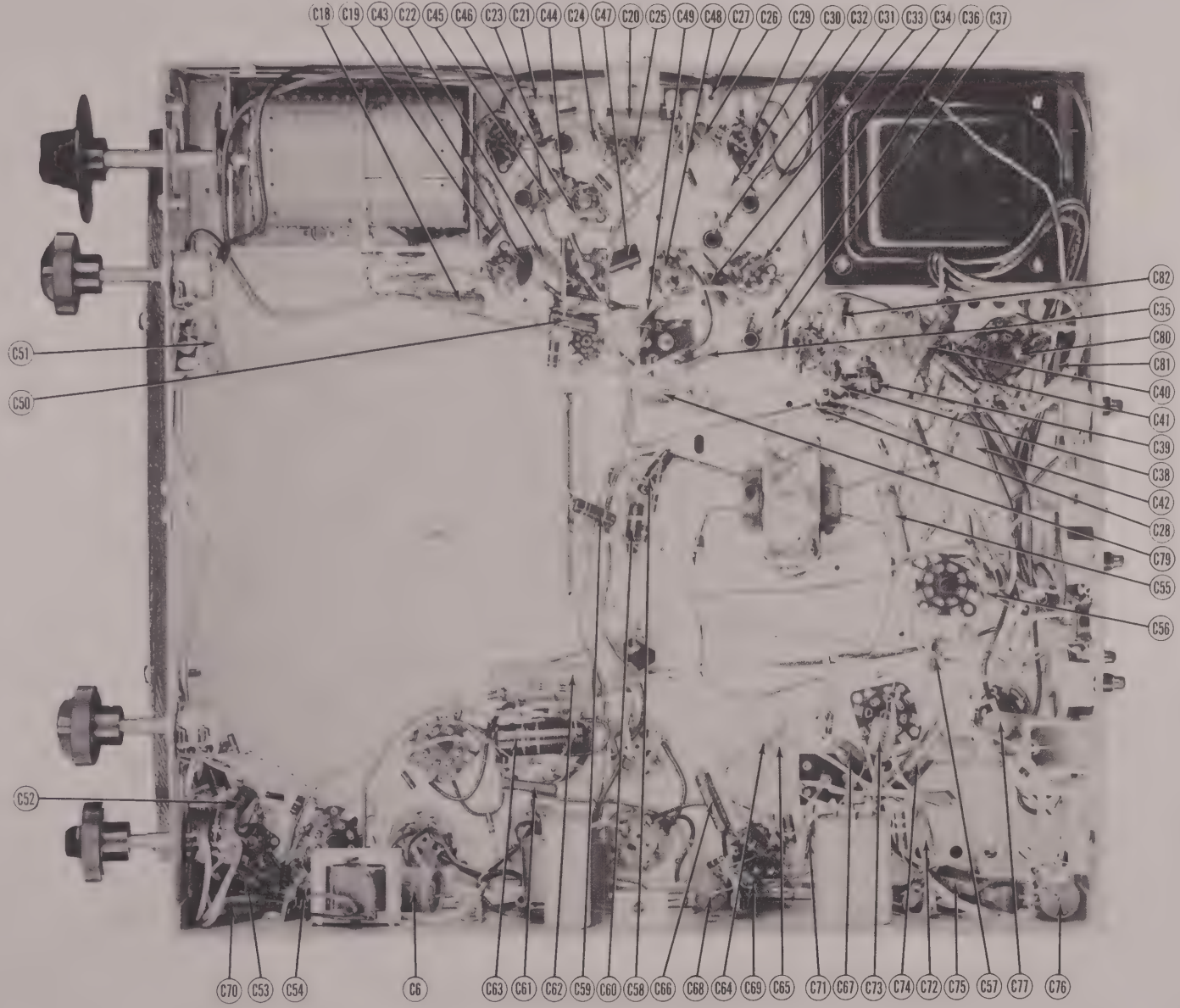
TOR AND ALIGNMENT IDENTIFICATION



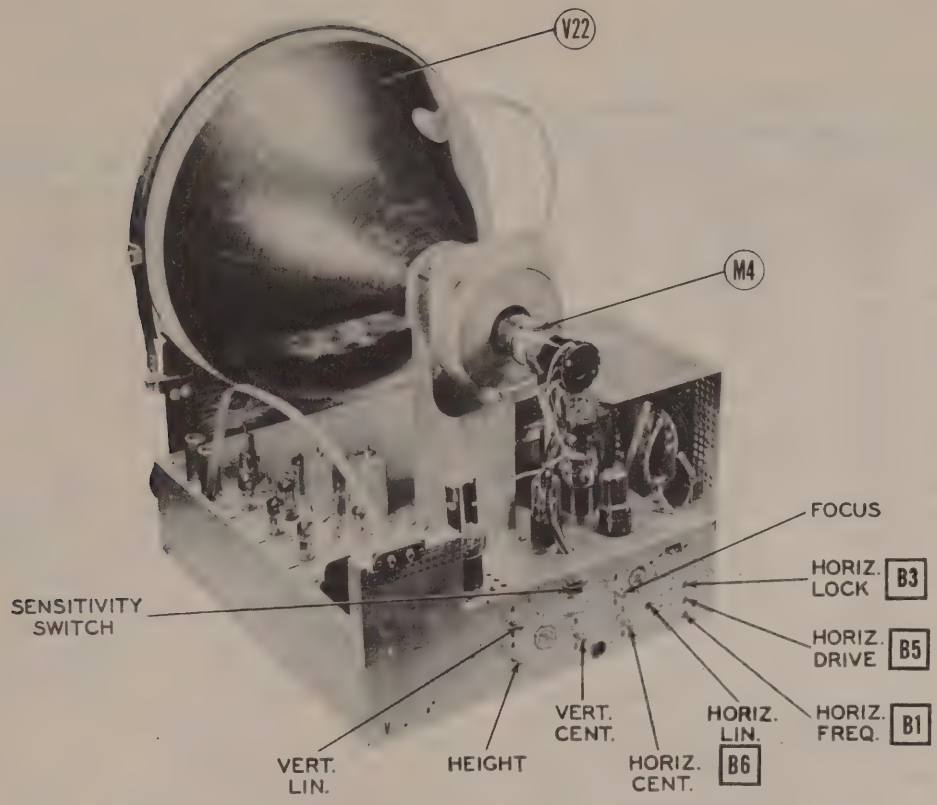
RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS-TOP VIEW

HORIZONTAL OSCILLATOR AND LINEARITY ADJUSTMENTS

HORIZONTAL OSCILLATOR ALIGNMENT CHECK:

Tune in test pattern and turn horizontal hold control to extreme counter-clockwise position. Picture should remain in synchronization. Turn channel switch to another channel and then back to the original channel. Normally, the picture should be out of synchronization. Turn the control clockwise and the picture should slowly begin to synchronize and finally lock-in. This should occur when the control is approximately 90° from the extreme counter-clockwise position. The picture should remain in synchronization for another 90° in the clockwise direction of the control. At the extreme clockwise position the picture should again drop out of synchronization and 3½ to 4½ bars should be seen sloping downward to the right. If the receiver fails to hold synchronization during this check with the hold control at the extreme counter-clockwise position or fails to hold synchronization for at least 60° in the clockwise direction from the point when it drops into sync it will be necessary to align the horizontal oscillator circuit as follows:

(A) HORIZONTAL OSCILLATOR ALIGNMENT:

Turn horizontal hold control to extreme clockwise position. Tune in test pattern and adjust trimmer B1 until picture is out of sync and shows 3½ to 4½ bars sloping downward to the right. If the trimmer has insufficient range, set it to its mid-position (one turn from tight) and adjust slug B2 until bars appear.

(B) HORIZONTAL LOCKING ALIGNMENT:

Turn the horizontal hold control to full counter-clockwise position. Switch to another channel and back to the original again.

Slowly turn horizontal hold control clockwise and note the least number of diagonal bars present just before picture syncs. If more than 4½ bars are present just before picture syncs. adjust "horizontal lock" trimmer B3 slightly clockwise. If less than 3½ bars are present adjust B3 slightly counter-clockwise and switch channel selector to another channel and back again. Recount bars present at the "lock-in" point. Repeat this procedure until 3½ to 4½ bars are present.

Repeat steps (A) and (B) until conditions exist as outlined under "Horizontal Oscillator Alignment Check".

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS:

Turn width control B4 to maximum clockwise position. Adjust "horizontal drive" trimmer B5 for maximum brightness and linearity. Adjust horizontal linearity B6 for best linearity in the right half of the picture. Readjust width control until picture fills the mask.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS:

Adjust the height control until picture fills mask vertically. Adjust the vertical linearity control until the test pattern ins symmetrical from top to bottom.

Due to intraction between these two controls it is necessary to repeat the adjustments. Adjust the vertical centering control to align the picture with the mask.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.		6AG5	7BD	
V2	Converter		6J6	7BF	
V3	1st Video IF		6AG5	7BD	
V4	2nd Video IF		6AG5	7BD	
V5	3rd Video IF		6AG5	7BD	
V6	4th Video IF		6AG5	7BD	
V7	Video Det.-AGC Rectifier		6AL5	6BT	
V8	Video Amp.		12AU7	9A	
V9	1st Sound IF		6BA6	7BK	
V10	2nd Sound IF		6BA6	7BK	
V11	Limiter		6AU6	7BK	
V12	Disc.		6AL5	6BT	
V13	AF Amp.-Sync. Clamper.		6AT6	7BT	
V14	Audio Output		6K6GT	7S	
V15	Sync. Amp.-Sync Sep.		6SN7GT	8BD	
V16	Vert. Osc.-Vert. Amp.		6SN7GT	8BD	
V17	Hor. AFC-Hor. Osc.		6SN7GT	8BD	
V18	Hor. Output		6BG6G	5BT	
V19	Damper		6W4GT	4CG	
V20	HV Rectifier		1B3GT	3C	
V21	LV Rectifier		5U4G	5T	
V22	Picture Tube		16DP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450		AFH8J8D26B		TVL-57	▪ Filter
B	40	150					▪ Filter
C	130	50					▲ Vert. Output Cath. Bypass
C2A	40	450		AFH8J2H		TVL-69	▪ Filter
B	10	350					▲ Filter
C3A	80	450		AFH16ZJ		TVL-47	▪ Filter
B	10	450					▲ Decoupling
C4A	10	450		AFH2J616G		TVL-56	▲ Decoupling
B	30	400					▪ Filter
C	30	300					▲ Filter
C5A	250	10		PRS12/250		TVL-66†	▪ Hor. Cent. Cont. Bypass
B	1000	6		PRS6/1000			▲ Vert. Cent. Cont. Bypass
C6	24	300		PRS350/24		TVA-23	Output Decoupling
C7	5			CN5DNPO	NPOK-5		Fixed Trimmer
C8	120			GP120M	GP2K-120		RF Decoupling
C9	1000			GP1000M	GP2L-001		RF Filament Bypass
C10	100			GP100K	GP1K-100		RF Coupling
C11	10			CN10DNPO	NPOK-10		Fixed Trimmer
C12	20			CN20DNPO	NPOK-20		Osc. Grid Cap.
C13	10			CN10DNPO	NPOK-10		Fixed Trimmer
C14	1000			GP1000M	GP2L-001		Conv. FilamentBypass
C15	1000			GP1000M	GP2L-001		RF Bypass
C16	.68			CN68JNPO	NPOL-68		Fixed Trimmer
C17	120	500		1468-00015	GP2K-120	1FM-315	IF Coupling
C18	.01	600		P688-01	821-01	TM-11	RF Bypass
C19	1500			GP1500M	GP2L-0015	1FM-215	Filament Bypass
C20	.25	400		P488-25		TC-2	AGC Filter
C21	1500			GP1500M	GP2L-0015	1FM-215	AGC Filter *
C22A	1500			GP1500M	GP2L-0015	29C6	RF Bypass
B	1500			GP1500M	GP2L-0015		2nd S. IF Plate Decoupling
C23	1500			GP1500M	GP2L-0015	1FM-215	1st V. IF Decoupling
C24	270	1000		1468-00025	GP2K-270	1FM-325	IF Coupling
C25A	1500			GP1500M	GP2L-0015	29C6	AGC Filter
B	1500			GP1500M	GP2L-0015		2nd V. IF Decoupling
C26	270	1000		1468-00025	GP2K-270	1FM-325	IF Coupling
C27	1500			GP1500M	GP2L-0015	1FM-215	AGC Filter
C28	1500			GP1500M	GP2L-0015	1FM-215	AGC Filter
C29	1500			GP1500M	GP2L-0015	1FM-215	3rd V. IF Screen Bypass
C30	1500			GP1500M	GP2L-0015	1FM-215	3rd V. IF Plate Decoupling
C31	270	1000		1468-00025	GP2K-270	1FM-325	IF Coupling
C32	75				NPOM-75		Fixed Trimmer
C33	100	500		1468-0001	GP1K-100	1FM-31	4th V. IF Cathode Bypass
C34	1500			GP1500M	GP2L-0015	1FM-215	4th V. IF Screen Bypass
C35	1500			GP1500M	GP2L-0015	1FM-215	4th V. IF Plate Decoupling
C36	270	1000		1468-00025	GP2K-270	1FM-325	IF Coupling
C37	220	500		1468-00025	GP2K-220	1FM-325	IF Coupling
C38	10	500		1468-00001	GP1K-10	MS-41	V. Diode Filter
C39	.047	400		P488-047		TM-15	Video Coupling
C40	.05	400		P488-05		TM-15	Video Coupling
C41	.005	600		P688-005	811-005	TM-25	2nd V. Amp. Cath. Bypass
C42	.25	400		P488-25		TC-2	Pic. Tube Cath. Dec.
C43A	1500			GP1500M	GP2L-0015	29C6	1st S. IF Cathode Bypass
B	1500			GP1500M	GP2L-0015		1st S. IF Screen Bypass
C44	1500			GP1500M	GP2L-0015	1FM-215	1st S. IF Plate Decoupling
C45	330	500		1468-00035	GP2K-330	1FM-335	IF Coupling
C46	1500			GP1500M	GP2L-0015	1FM-215	2nd S. IF Screen Bypass
C47	330	500		1468-00035	GP2K-330	1FM-335	Limiter Grid Filter
C48	1500			GP1500M	GP2L-0015	1FM-215	Limiter Decoupling
C49	270	1000		1468-00025	GP2K-270	1FM-325	RF Bypass
C50	.0022	600		P688-0022	GP2M-0022	TM-22	Audio Coupling
C51	.01	600		P688-01	821-01	TM-11	Audio Coupling
C52	.002	600		P688-002	GP2M-002	TM-22	De-emphasis
C53	.01	600		P688-01	821-01	TM-11	Audio Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C54	.005	600		P688-005	811-005	TM-25	Output Plate Bypass
C55	.05	400		P488-05		TM-15	Sync. Coupling
C56	220	500		1468-00025	GP2K-220	1FM-325	Sync. Coupling
C57	390	1000		1468-0004	GP2K-390	1FM-34	Sync. Sep. Cathode Bypass
C58	.0022	600		P688-0022	GP2M-0022	TM-22	Integrator Net.
C59	.0047	600		P688-0047	GP2M-0047	TM-25	Integrator Net.
C60	.0047	600		P688-0047	GP2M-0047	TM-25	Integrator Net.
C61	4700			GP4700M	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C62	.1	1000		1084-1		PX-11	Vert. Discharge
C63	.22	400		P488-22		TC-2	Vert. Sweep Coupling
C64	120	1000		1468-00015	GP2K-120	1FM-315	Hor. Sync. Coupling
C65	120	1000		1468-00015	GP2K-120	1FM-315	Voltage Divider
C66	.002	600		P688-002	GP2M-002	TM-22	Hor. Sync. Coupling
C67	4	1500					Hor. Feedback
C68	.25	400		P488-25		TC-2	AFC Filter
C69	.022	400		P488-022		TM-12	AFC Filter
C70	.05	400		P488-05		TM-15	AFC Plate Bypass
C71	180	1000		1468-0002	GP2K-180	1FM-32	Hor. Osc. Grid Cap.
C72	2200	1000			GP2M-0022		Hor. Discharge
C73	390	1000		1468-0004	GP2K-390	1FM-34	Hor. Sweep Coupling
C74	.05	600		P688-05		TM-15	Hor. Output Screen Bypass
C75	.25	400		P488-25		TC-2	Hor. Output Cath. Bypass
C76	.1	1000		1084-1		PX-11	Damper Filter
C77	.035	1000		P1088-033			Damper Filter
C78	500	15000			410-500		HV Filter
C79	1500			GP1500M	GP2L-0015	1FM-215	RF Bypass *
C80	.01	600		P688-01	821-01	TM-11	Line Filter
C81	.01	600		P688-01	821-01	TM-11	Line Filter
C82	1500			GP1500M	GP2L-0015	1FM-215	DAGC Decoupling *

* Not used in all models.
† Enlarge hole and install new mounting hplate.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½		B11-137 *		Vert. Hold Control, panel
B	50KΩ	½		B11-123 *	PT-1479	Horiz. Hold Control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R2A	500KΩ	½		B11-133 *		Brightness control, panel
B	10KΩ	½		B11-116 *	PT-1478	Contrast control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R3A	1 Meg.	½		Q13-137	M-63-Z	Volume control
B	Switch			76-1	SW-A	Attach to R3A per instructions
R4	5000Ω	½		Q11-114	M-19-S	Vert. linearity control
R5	2.5 Meg.	½		Q11-239	M-84-S	Height control
R6	20Ω	2		W-20x10	43-20CT	Vert. centering control-Wire Wound, tapped at 10Ω
R7	30Ω	2		W-30	43-30	Horiz. centering control, Wire Wound
R8	2250Ω	4			10-2500	Focus control-Wire Wound

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES: ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R9	3900Ω	½		BTS-3900	RF Grid
R10	47KΩ	½		BTS-47K	AGC Network
R11	10KΩ	½		BTS-10K	RF Plate Coil Shunt
R12	2200Ω 20%	½		BTS-2200	RF Decoupling
R13	4700Ω	½		BTS-4700	Mixer Grid
R14	220KΩ 20%	½			Mixer Grid
R15	10KΩ	½		BTS-10K	Osc. Grid
R16	4700Ω	½		BTS-4700	Osc. Plate
R17	4700Ω	½		BTS-4700	Voltage Divider
R18	10KΩ	½			1st Video IF Grid
R19	39Ω	½			1st Video IF Cathode
R20	1000Ω 20%	½		BTS-1000	1st Video IF Decoupling
R21	1000Ω 20%	½		BTS-1000	AGC Network
R22	10KΩ	½			2nd Video IF Grid
R23	39Ω	½			2nd Video IF Cathode
R24	1000Ω 20%	½		BTS-1000	2nd Video IF Decoupling
R25	1 Meg. 20%	½		BTS-1 Meg.	AGC Network
R26	1000Ω 20%	½		BTS-1000	AGC Network
R27	4700Ω	½			3rd Video IF Grid
R28	39Ω	½			3rd Video IF Cathode
R29	5600Ω 5%	½			3rd Video IF Plate
R30	1000Ω 20%	½		BTS-1000	3rd Video IF Plate Decoupling
R31	1000Ω 20%	½		BTS-1000	3rd Video IF Screen Decoupling
R32	100KΩ	½		BTS-100K	AGC Network
R33	150Ω	½			4th Video IF Cathode
R34	5600Ω 5%	½			4th Video IF Plate
R35	1000Ω 20%	½		BTS-1000	4th Video IF Plate Decoupling
R36	1000Ω 20%	½		BTS-1000	4th Video IF Screen Decoupling
R37	1 Meg. 20%	½		BTS-1 Meg.	AGC Rect. Diode Load
R38	560KΩ 5%	½		BTS-560K-5%	Voltage Divider
R39	5600Ω 5%	½		BTS-5600-5%	Video Det. Diode Load
R40	1 Meg. 20%	½		BTS-1 Meg.	Video Amp. Grid
R41	3300Ω 20%	½		BTS-3300	Video Amp. Cathode
R42	3900Ω	½		BTS-3900	Video Amp. Plate
R43	1 Meg. 20%	½		BTS-1 Meg.	Video Amp. Grid
R44	150Ω	½			Video Amp. Cathode
R45	3300Ω	1		BTA-3300	Video Amp. Plate
R46	820Ω	½		BTS-820	Video Amp. Plate
R47	100KΩ	½		BTS-100K	Voltage Divider
R48	150Ω	½			1st Sound IF Cathode

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R49	1000Ω 20%	½		BTS-1000	1st Sound IF Screen Decoupling
R50	1000Ω 20%	½		BTS-1000	1st Sound IF Plate Decoupling
R51	22KΩ 20%	½			2nd Sound IF Grid
R52	150Ω	½			2nd Sound IF Cathode
R53	1000Ω 20%	½		BTS-1000	2nd Sound IF Screen Decoupling
R54	1000Ω 20%	½		BTS-1000	2nd Sound IF Plate Decoupling
R55	22KΩ 20%	½			Limiter Grid
R56	10KΩ	½			Limiter Decoupling
R57	100KΩ	½		BTS-100K	Disc. Diode Load
R58	100KΩ	½		BTS-100K	Disc. Diode Load
R59	10 Meg. 20%	½		BTS-10 Meg.	AF Grid
R60	330KΩ	½		BTS-330K	AF Plate
R61	470KΩ 20%	½		BTS-470K	Output Grid
R62	1000Ω 20%	1		BTA-1000	Filter
R63	1 Meg. 20%	½		BTS-1 Meg.	Sync. Amp. Grid
R64	560Ω	½		BTS-560	Sync. Amp. Cathode
R65	22KΩ 20%	1		BTA-22K	Sync. Amp. Plate
R66	6800Ω 20%	½		BTS-6800	Sync. Sep. Cathode
R67	3.9 Meg.	½		BTS-3.9 Meg.	Sync. Sep. Grid
R68	22KΩ 20%	½		BTS-22K	Integrator
R69	8200Ω	½		BTS-8200	Integrator
R70	8200Ω	½		BTS-8200	Integrator
R71	1 Meg.	½		BTS-1 Meg.	Vert. Osc. Grid
R72	1 Meg.	½		BTS-1 Meg.	Vert. Osc. Plate
R73	6.8 Meg.	½		BTS-6.8 Meg.	Voltage Divider
R74	100KΩ	½		BTS-100K	Voltage Divider
R75	560Ω	½		BTS-560	Vert. Amp. Cathode
R76	2.2 Meg. 20%	½		BTS-2.2 Meg.	Vert. Amp. Grid
R77	3300Ω 20%	½		BTS-3300	Vert. Peaking
R78	560KΩ	½		BTS-560K	Horiz. AFC Grid
R79	180KΩ	½		BTS-180K	Horiz. AFC Cathode
R80	100KΩ 5%	½		BTA-100K-5%	Horiz. AFC Cathode
R81	8200Ω	½		BTS-8200	Horiz. AFC Filter Network
R82	150KΩ	½		BTS-150K	Horiz. AFC Filter Network
R83	3.3 Meg.	1		BTA-3.3 Meg.	Voltage Divider
R84	100KΩ 5%	1		BTA-100K-5%	Horiz. Osc. Grid
R85	10KΩ	½		BTS-10K	Horiz. Osc. Transformer Shunt
R86	120KΩ	1		BTA-120K	Horiz. Osc. Plate
R87	270KΩ	1		BTA-270K	Voltage Divider
R88	120KΩ	½		BTS-120K	Voltage Divider
R89	10KΩ 20%	½		BTS-10K	Filter
R90	47Ω 20%	½			Parasitic Supp.
R91	1 Meg. 20%	½		BTS-1 Meg.	Horiz. Output Grid
R92	82Ω	1		BW-1-82	Horiz. Output Cathode
R93	4700Ω	1		BTA-4700	Horiz. Output Screen
R94	56KΩ	1		BTS-56K	Filter
R95	560KΩ	½		BTS-560K	Feedback
R96	3.3Ω	1			HV Rect. Filament-Wire Wound
R97	1 Meg. 20%	2			HV Filter
R98	680Ω	1		BTA-680	Focus Coil Shunt-See Note 1
R99	470Ω	1		BTA-470	Focus Coil Shunt-See Note 2
R100	470Ω	1		BTA-470	Focus Coil Shunt-See Note 2
R101A	610Ω	20			Bias Network-Wire Wound
B	1125Ω	20			Filter-Wire Wound
R102	3300Ω	1		BTA-3300	Bleeder
R103A	8200Ω	5			Bleeder-Wire Wound
B	35Ω	1			Bias Network-Wire Wound
C	100Ω	2			Bias Network-Wire Wound

Note 1. Not used in all models.
Note 2. Some models use 680Ω, 1 watt resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC ② 2.05A	760VCT .275ADC	5VAC ② 3A	6.3VAC ② 9.2A SEC. 4 6.3VAC ② 6A		P-8153 ① and P-5014	P-3059	TP-355

① Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: STARRETT PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	180Ω	1000Ω SEC. 1		A-8111 ①	A-3000 ②	TBO-1 ①	Vert. Block Osc. Trans.
T3	290Ω Tap. ② 90Ω	7Ω Tap. ② .5Ω SEC. 2 0Ω		A-8128	HVO-3	TFB-3	Hor. Output Trans.
T4	770Ω	8.2Ω		A-8112	A-3035 ③	TSO-5	Vert. Output Trans.
T5A	14Ω			DY-1			Hor. Deflection Coil
B	60Ω						Vert. Deflection Coil
T6	410Ω						Focus Coil

② Drill one new mounting hole.
③ Drill new mounting holes.

STARRETT MODELS "HENRY HUDSON," "HENRY PARKS," "ROBERT E. LEE"

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		STARRETT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T7	6.2KΩ	3.7Ω	275Ω	.4Ω		A-8114	A-2931	RO-13	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	STARRETT PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.4Ω		ST-119 ① MOD. P10-T	10A31	① Replace output transformer to match 6-8Ω voice coil.
	CONE DIA.	V. C. DIA.				
SP2	9 1/2"	3/4"				

FILTER CHOKE

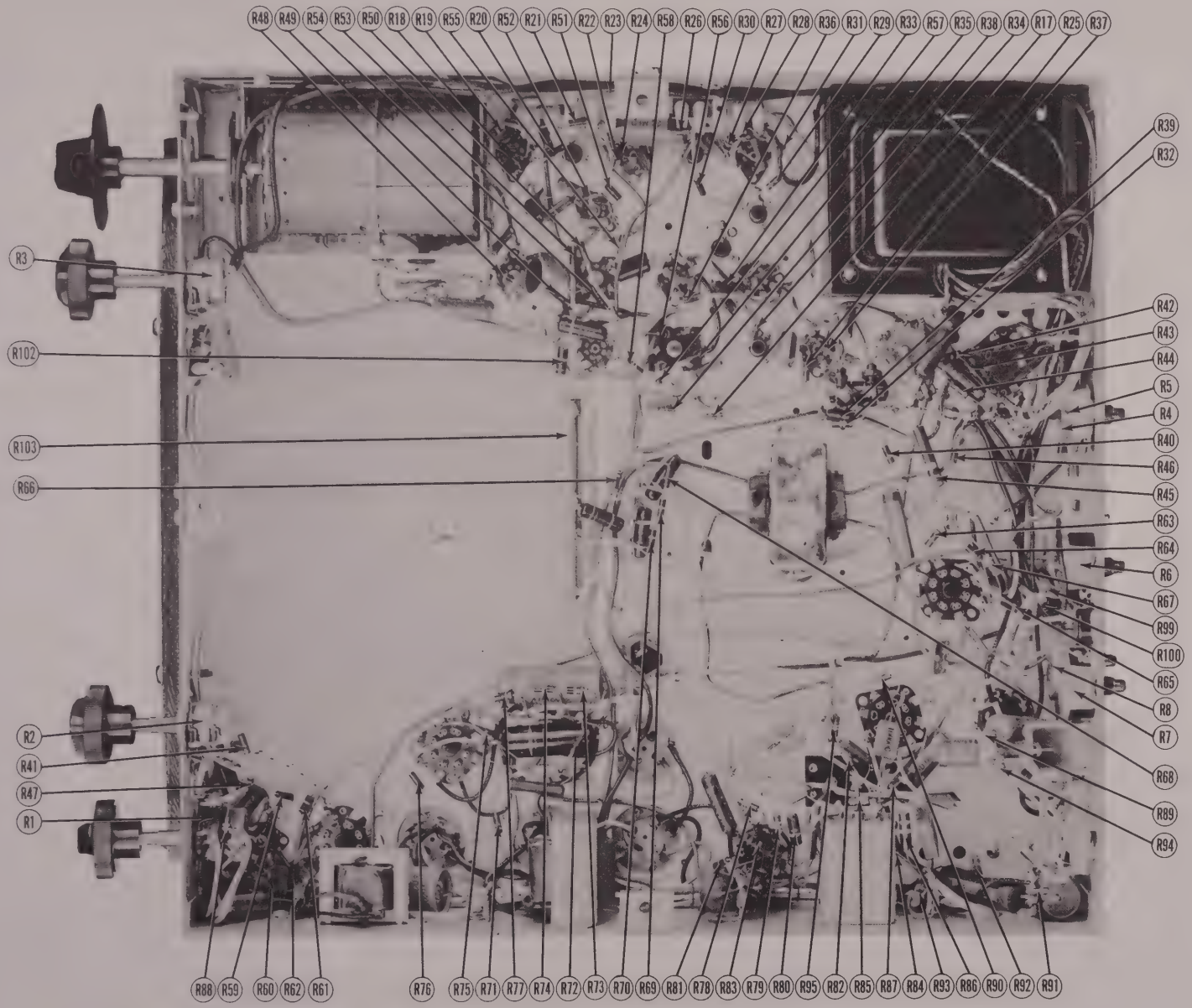
ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	STARRETT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.275A	62Ω	2.6 Henries		C-2326 ②	C-2991 ②	TR-3300 ②	② Drill one new mounting hole.

COILS (RF-IF)

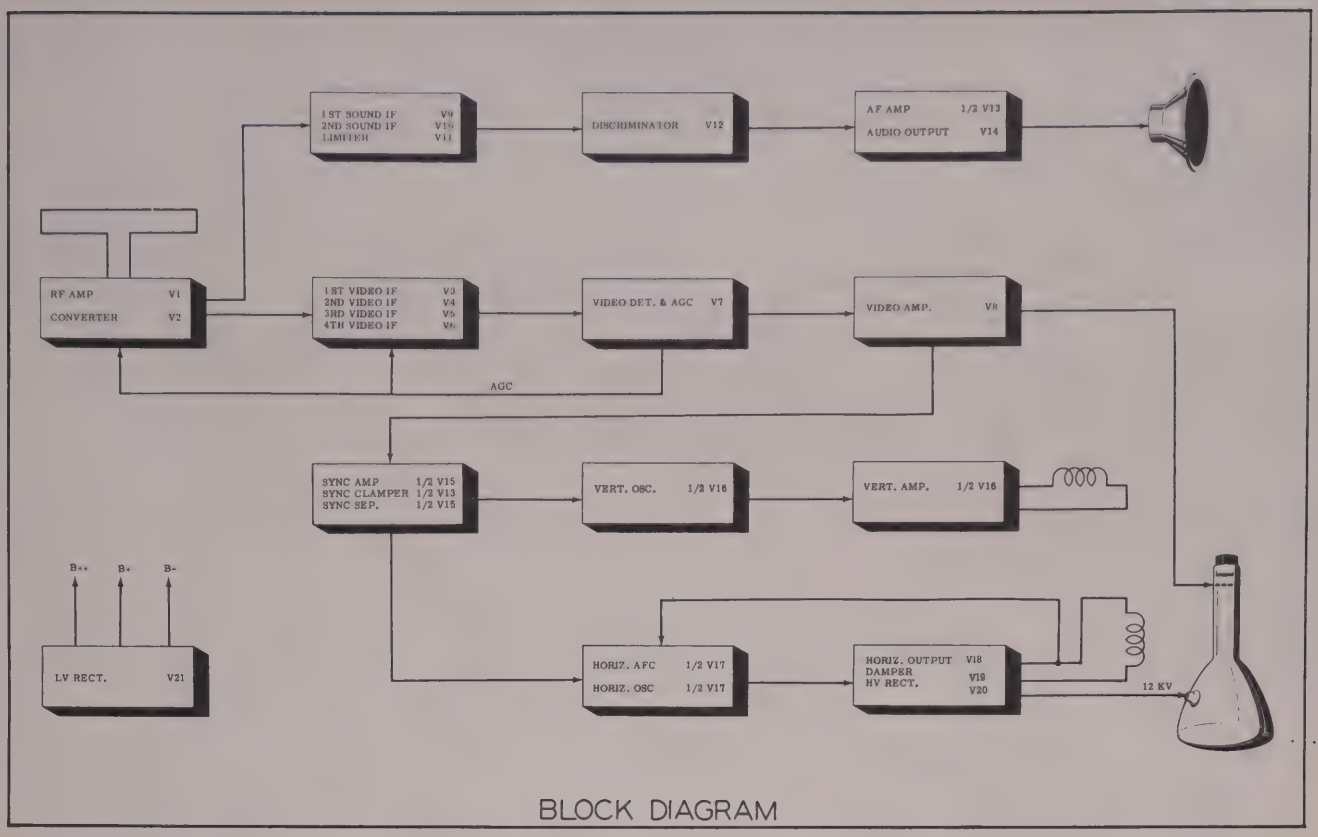
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	STARRETT PART No.	MEISSNER PART No.	
L2	Ant. Coil	0Ω				
L3	RF, Mixer & Osc. Coils	0Ω				
L4	Fil. Choke	0Ω				
L5	Fil. Choke	0Ω				
L6	1st Video IF & Sound Trap	.2Ω	0Ω			
L7	Video Coupling	1Ω				
L8	2nd Video IF	.2Ω				
L9	3rd Video IF	.2Ω				
L10	4th Video IF	.2Ω				
L11	Sound Trap	.2Ω	0Ω			
L12	5th Video IF	.2Ω				
L13	Peaking	3Ω				36 microhenries, black dot.
L14	Peaking	8Ω				180 microhenries, wound on 39KΩ resistor. white dot.
L15	Peaking	5.5Ω				122 microhenries, wound on 22KΩ resistor. blue dot.
L16	1st Sound IF	.2Ω				
L17	2nd Sound IF	.2Ω	.1Ω			
L18	Disc. Trans.	.1Ω	.1Ω			
L19	Horiz. Osc.	150Ω				
L20	Width Cont.	.2Ω				Not used in all models.
L21	Horiz. Linearity	36Ω				

MISCELLANEOUS

ITEM No.	PART NAME	STARRETT PART No.	NOTES
M1	RF Tuner		
M2	Switch		Sensitivity
M3	Fuse		.25A, 250V
M4	Ion Trap		Permanent magnet type



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



BLOCK DIAGRAM

PHOTOFACT* Folder

SYLVANIA MODELS 1-075, 1-113, 1-114, 1-124, 1-125, 1-177

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SYLVANIA MODELS 1-075, 1-113, 1-114, 1-124, 1-125, 1-177

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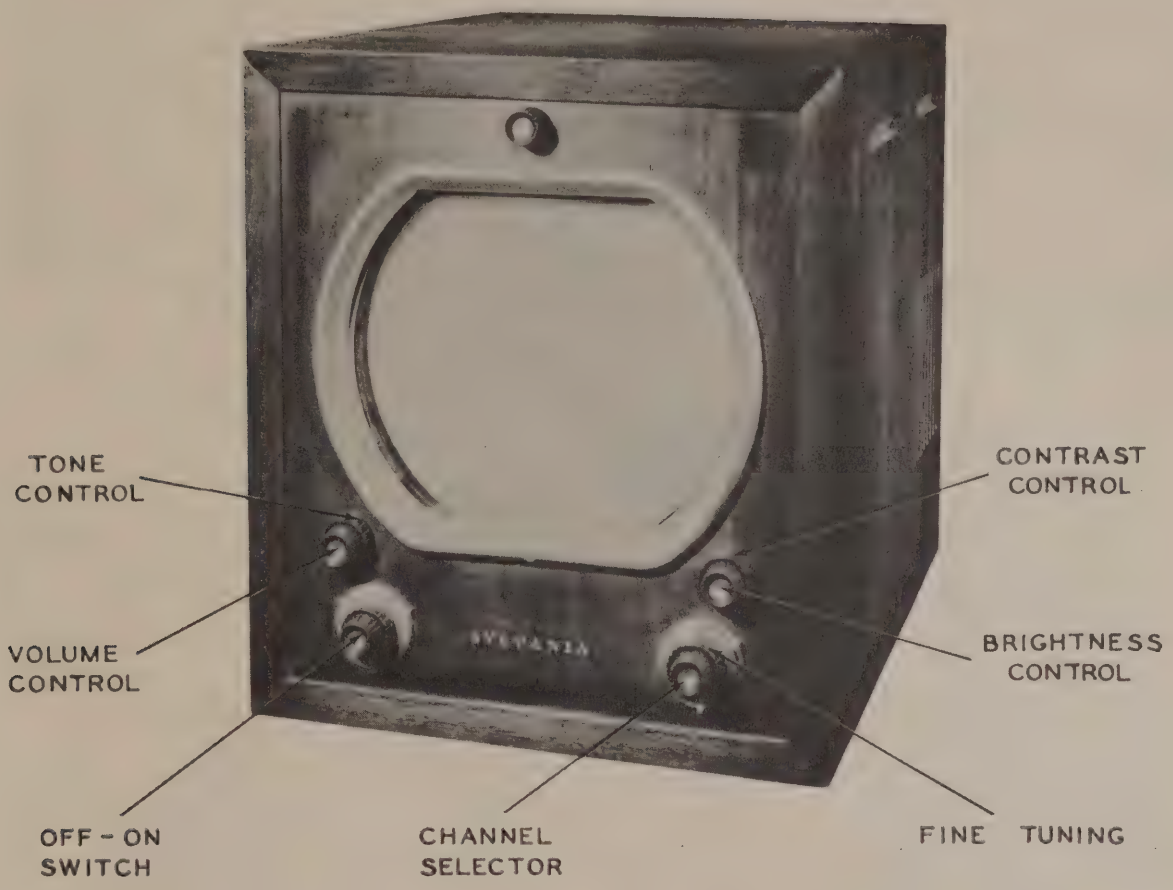

SYLVANIA MODELS 1-075, 1-113, 1-114, 1-124, 1-125, 1-177

SYLVANIA MODEL 1-075

TRADE NAME	Sylvania Models 1-075, 1-113, 1-114, 1-124, 1-125 (Ch. 1-139) 1-177 (Ch. 1-186)
MANUFACTURER	Sylvania Elect. Prod. Inc., Colonial Radio & Tel. Div. 254 Rano St., Buffalo 7, New York
TYPE SET	Television Receiver
TUBES	Twenty Eight

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 2.19 Amp. at 117 Volts AC
TUNING RANGE—Channels 2 thru 13

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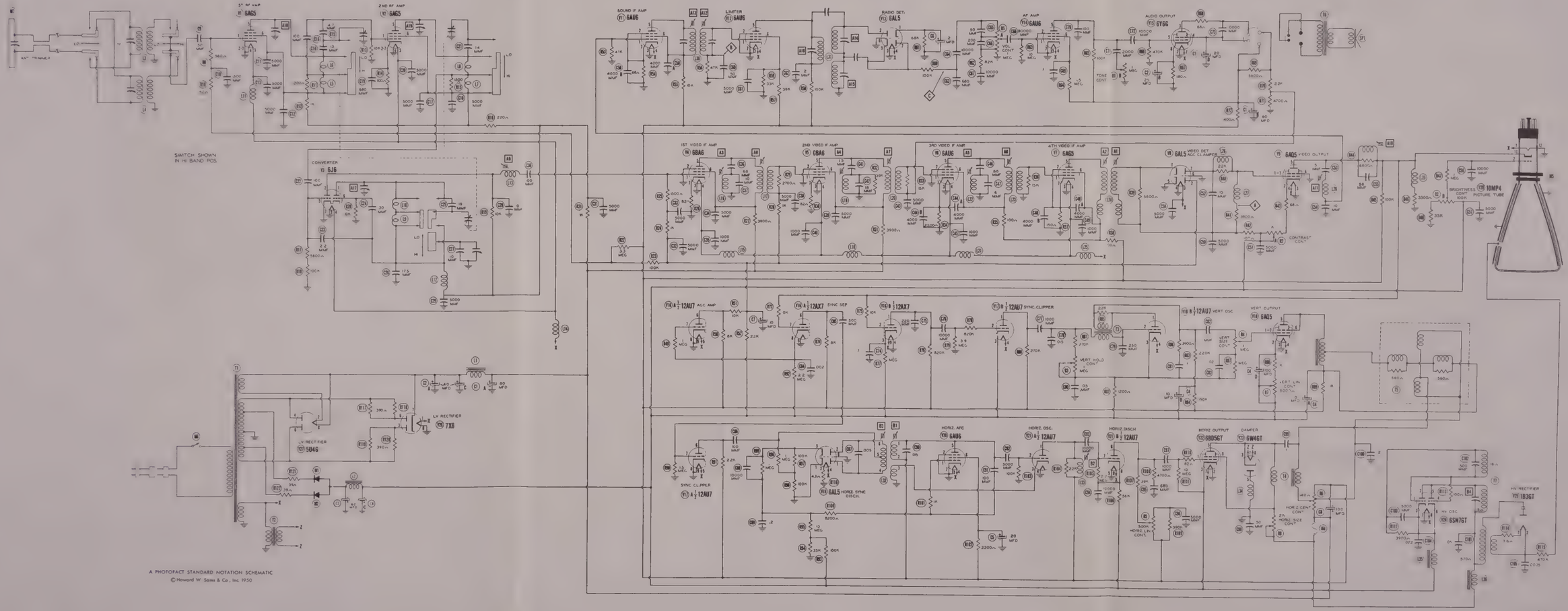
SWITCH SHOWN IN HI BAND POS.
CONVERTER V3 6J6
1ST RF AMP V1 6AG5
2ND RF AMP V2 6AG5
SOUND IF AMP V11 6AU6
LIMITER V12 6AU6
RADIO DET. V13 6AL5
AF AMP V14 6AU6
AUDIO OUTPUT V15 6Y6G
1ST VIDEO IF AMP V4 6BA6
2ND VIDEO IF AMP V5 6BA6
3RD VIDEO IF AMP V8 6AU6
4TH VIDEO IF AMP V7 6AG5
VIDEO DET. AGC CLAMPER V8 6AL5
VIDEO OUTPUT V9 6AQ5
V10 A 1/2 12AU7 AGC AMP
V10 B 1/2 12AX7 SYNC SEP
V11 B 1/2 12AU7 SYNC CLIPPER
V11 A 1/2 12AU7 SYNC CLIPPER
V9 6AL5 HORIZ SYNC DISCH.
HORIZ. AFC V6 6AU6
HORIZ. OSC. V11 A 1/2 12AU7
HORIZ. DISCH. V10 B 1/2 12AU7
VERT. OSC. V10 B 1/2 12AU7
VERT. OUTPUT V10 6AQ5
HORIZ OUTPUT V12 6BQ5GT
DAMPER V13 6W4GT
HV OSC V14 6SN7GT
HV RECTIFIER V15 1B3GT
LV RECTIFIER V16 5U4G
LV RECTIFIER V16 7X8
18MP4 PICTURE TUBE
BRIGHTNESS CONT. 100K
CONTRAST CONT.
VERT. HOLD CONT.
VERT. SIZE CONT.
VERT. LIN. CONT. 500K
HORIZ. SIZE CONT.
HORIZ. LIN. CONT. 500K
HORIZ. CENT. CONT.
TONE CONT.
VOL. CONT. MEG.

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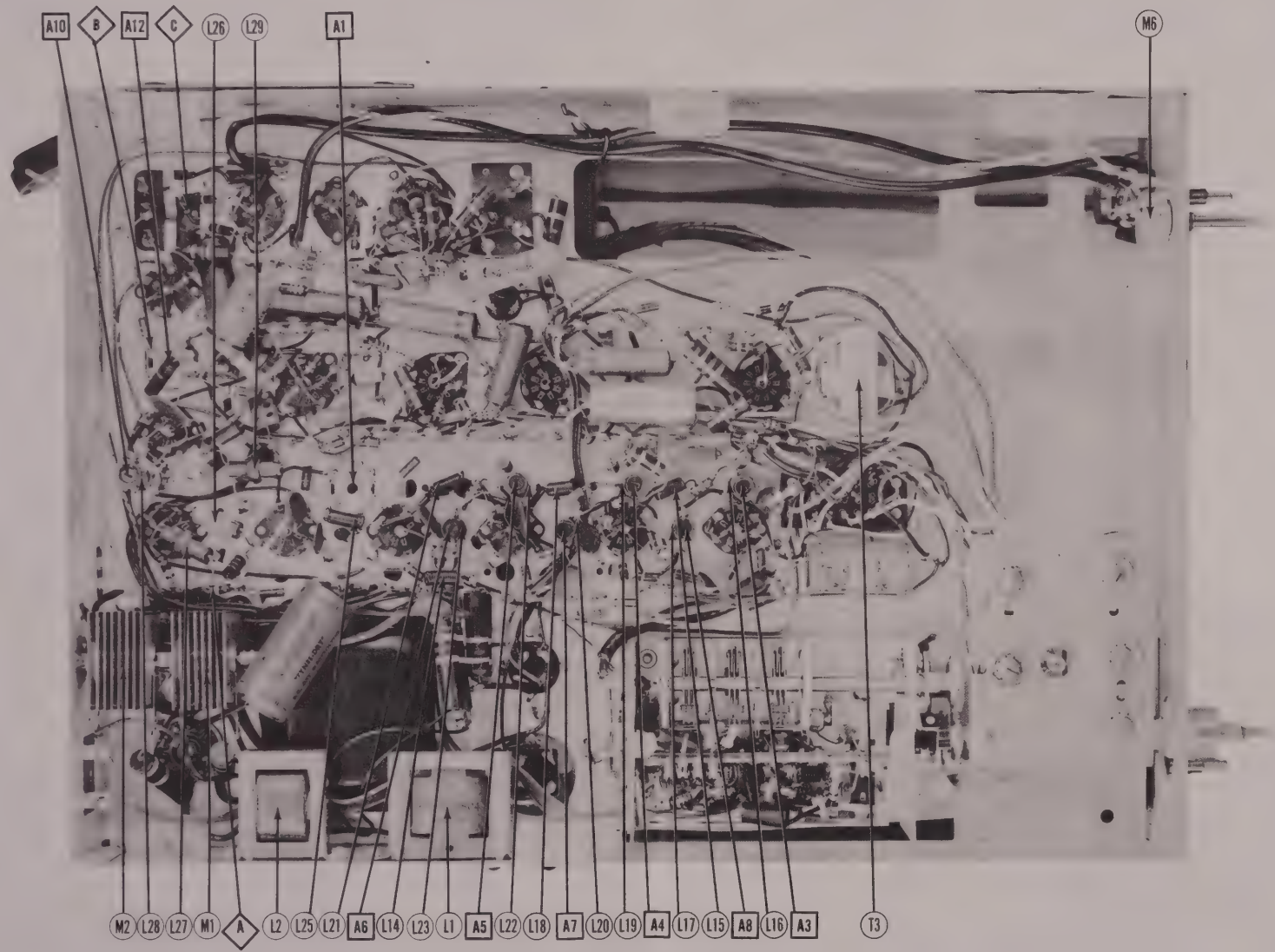
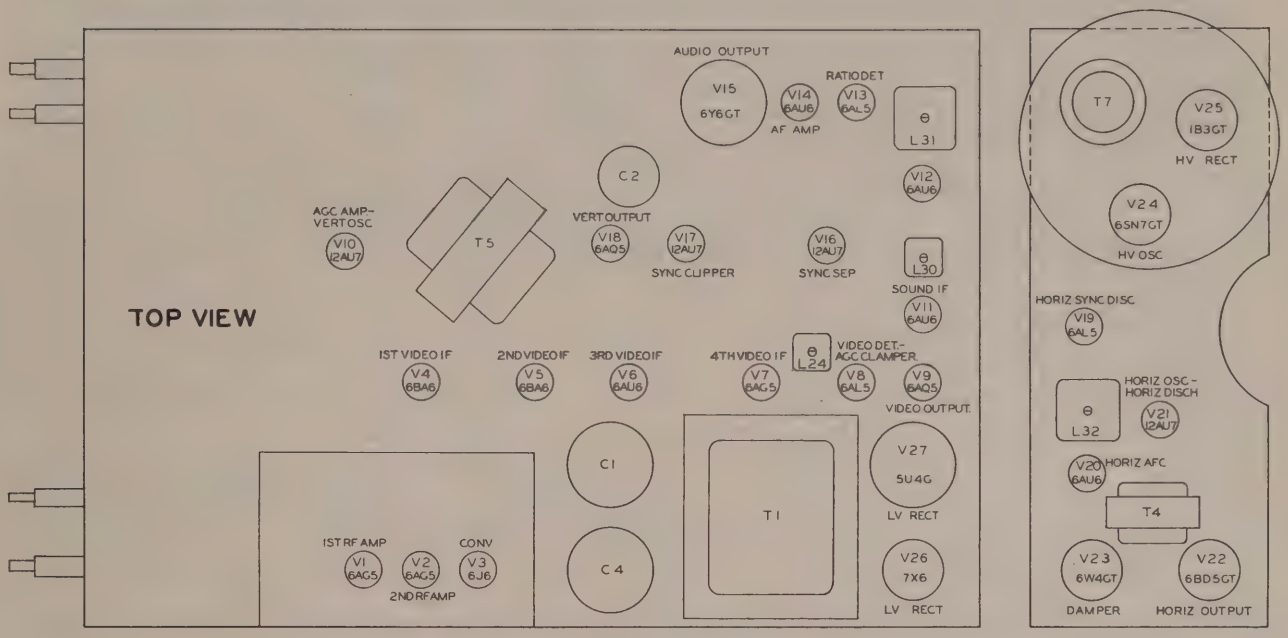
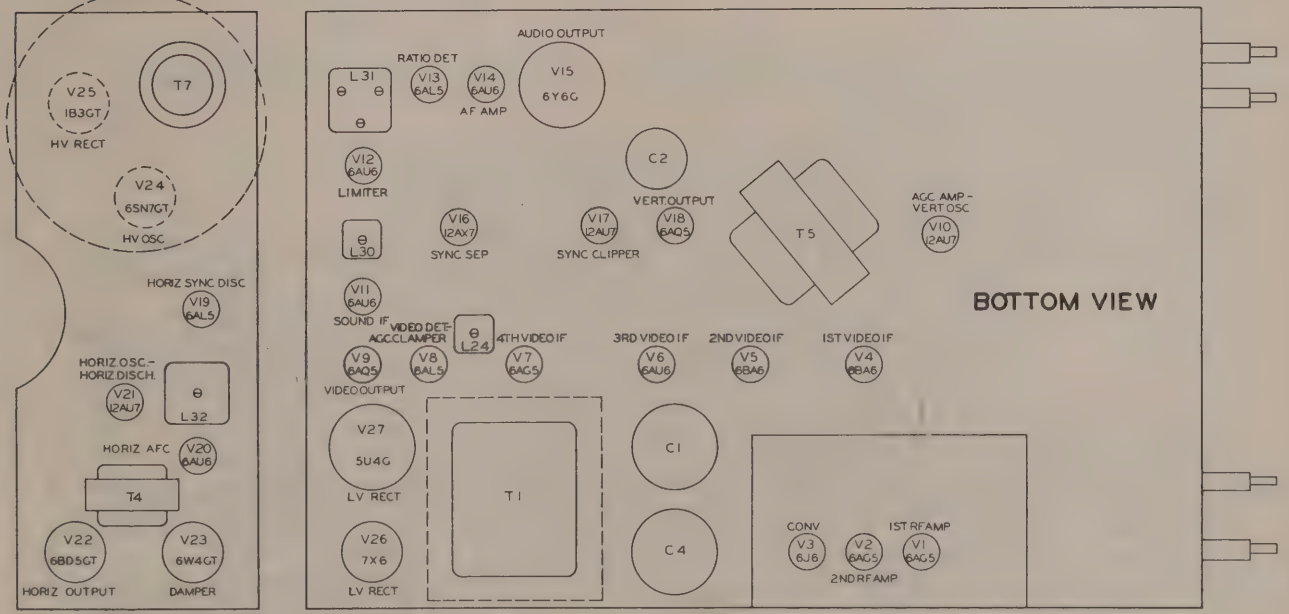
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

SYLVANIA MODELS 1-075, 1-113, 1-114, 1-124, 1-125, 1-177

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the high voltage oscillator tube (V24) from its socket.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the junction of R22 and C32, connect the positive lead to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Note that the common lead of the VTVM used during video IF alignment is -125 volts with respect to chassis, avoid touching or grounding the VTVM case.
Remove the converter tube (V3) and replace it with a 6J6 which has had pin 1 removed.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.005MFD	High side to pin 1 (Grid) of 6AG5 (V7). Low side to chassis.	24MC (10MC SWP)	27.4MC 21.9MC	Any	Vert. Amp. to Point (A). Low side to chassis.	A1, A2	Adjust for response curve similar to Fig 1 with markers as shown.
2.	Direct	High side to ungrounded tube shield floating over converter tube (V3). Low side to chassis.	Not used	20.4MC (Unmod.)	"	Use VTVM. DC Probe and common leads across R41. (See note above)	A3	Adjust for MINIMUM deflection.
3.	Direct	"	"	21.9MC	"	"	A4	"
4.	Direct	"	"	27.9MC	"	"	A5	"
5.	Direct	"	"	26.3MC	"	"	A6	Adjust for maximum deflection.
6.	Direct	"	"	23.4MC	"	"	A7	"
7.	Direct	"	"	25.0MC	"	"	A8	"
8.	Direct	"	"	24.3MC	"	"	A9	"
9.	Direct	"	24MC (10MC SWP)	23.1MC 26.4MC	"	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to Fig 2. If necessary retouch A6 thru A9 for proper response.

4.5MC TRAP ADJUSTMENT

Pre-Set All maximum counter-clockwise, (fully out).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT • VTVM	ADJUST	REMARKS
10.	.005MFD	High side to pin 7 (Grid) of 6AQ5 (V9). Low side to chassis.	4.1MC (Unmod.)	Any	Connect high frequency probe to pin 1 (cathode) of picture tube (V28). Common to chassis.	A10	Adjust for maximum deflection.
11.	.005MFD	"	4.5MC (max. output).	"	"	A11	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	.005MFD	High side to pin 1 (Grid) of 6AQ5 (V9). Low side to chassis.	4.5MC (1MC SWP)	4.5MC	Any channel not used locally	Vert. Amp. thru 40KΩ to Point (B). Low side to chassis.	A12, A13	Adjust for maximum amplitude and symmetry as per Fig 3.
13.	.005MFD	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A14, A15, A16	Adjust for response curve similar to Fig 4. The response should be linear between 4.45 and 4.55MC.

RF TUNER ALIGNMENT

Connect the three volt bias battery as outlined under video IF alignment.
The two trimmer capacitors located near the front of the tuner are for the purpose of adjusting the antenna input circuit. These trimmers are pre-set and sealed at the factory, they should not be adjusted in the field.
Remove the dummy converter tube and replace the original tube.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

HIGH BAND OSCILLATOR ALIGNMENT

Turn the band selector switch to "high band," (counter-clockwise).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	217.25MC 21.9MC	Turn tuning gang fully open	Vert. Amp. to Point (D). Low side to chassis.	A17	Adjust so the 21.9MC and 217.25MC marker coincide at 100% response as shown in Fig 5.
15.	"	"	177MC (10MC SWP)	177.25MC 21.9MC	Turn tuning gang fully closed	"	L10	Expand or compres coil turns so the 21.9MC and 177.25MC markers coincide at 100% response as shown in Fig 6. Repeat steps 14 and 15 until no further improvement can be made.

HIGH BAND RF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	21.9MC 26.4MC	Turn tuning gang fully open	Vert. Amp. to Point (D). Low side to chassis.	A18, A19	Adjust A18 for maximum amplitude at the 21.9MC point on response curve. Adjust A19 for maximum amplitude at the 26.4MC point on response curve. See Fig 7.
17.	"	"	177MC (10MC SWP)	21.9MC 26.4MC	Turn tuning gang fully closed	"	L6, L8	Expand or compress turns of L6 for maximum amplitude at 21.9MC point on response curve and adjust L8 for maximum amplitude at 26.4MC point on response curve. See Fig 7.

ALIGNMENT INSTRUCTIONS (CONT.)

LOW BAND OSCILLATOR ALIGNMENT

Turn the band selector to "low band", (clockwise).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	21.9MC 89.25MC	Turn tuning gang fully open	Vert. Amp. to Point (D). Low side to chassis.	L9	Expand or compress coils turns so the 21.9 MC marker and 89.25MC marker coincide at 100% response as shown in Fig 8.
19.	"	"	57MC (10MC SWP)	21.9MC 58.75MC	Turn tuning gang fully closed	"		Check the coincidence of the 21.9MC marker and 58.75MC marker. If they are not within 1/2 MC, it will be necessary to compromise between the high band and low band. There should be no more than 1/2 MC difference between the markers on any channel.

LOW BAND RF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
20.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	21.9MC 26.4MC	Turn tuning gang fully open	Vert. Amp. to Point (D). Low side to chassis.	L5, L7	Expand or compress turns of L5 for maximum response at 21.9MC point on response curve. Adjust turns of L7 for maximum amplitude at 26.4MC point on response curve. Check all low band channels, if the markers fall below 70% or the dip which may appear exceeds 30%, on any channel compromise adjustment of L5 and L7 will be required.

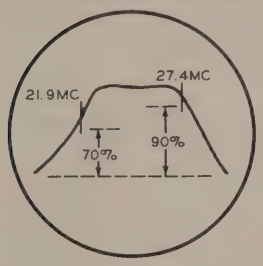


FIG.1

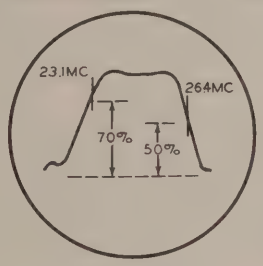


FIG.2

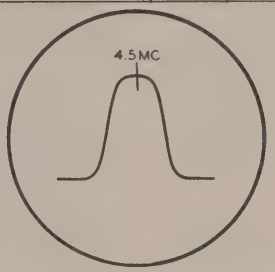


FIG. 3

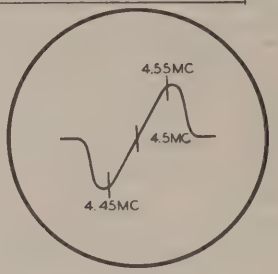


FIG. 4

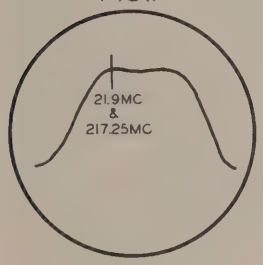


FIG.5

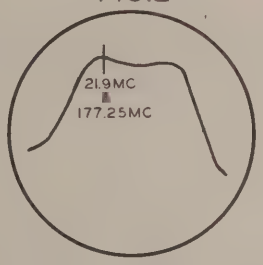


FIG.6

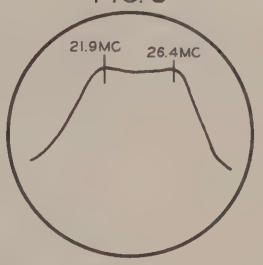


FIG.7

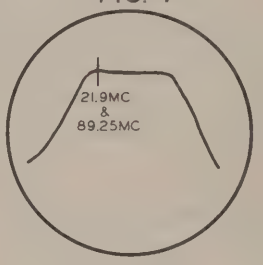
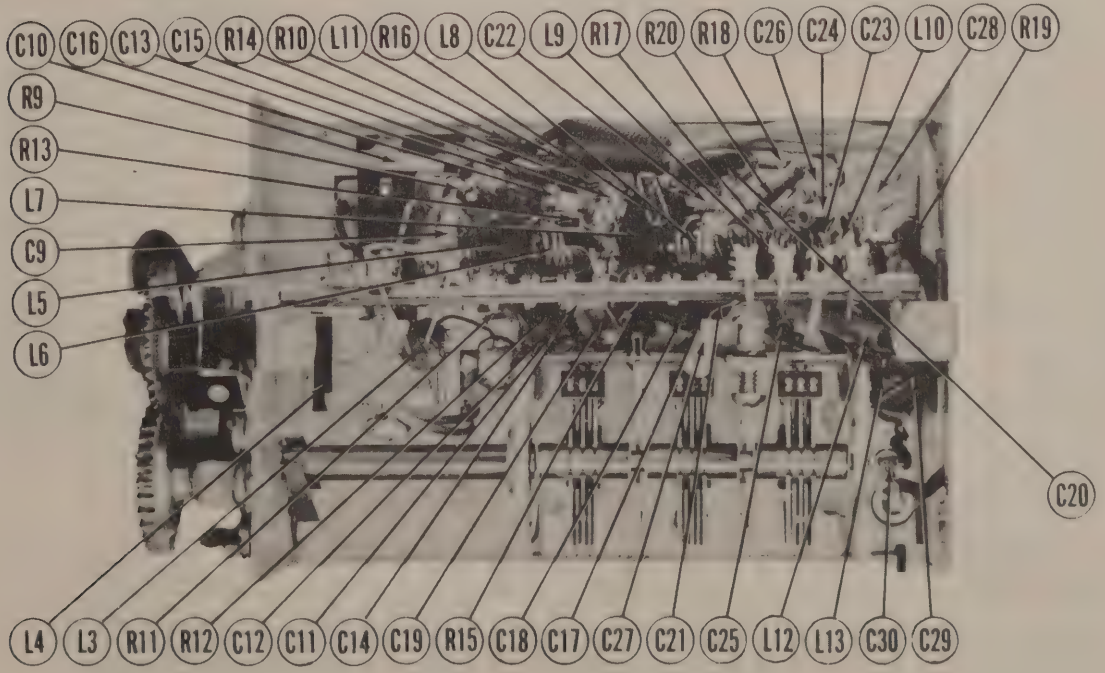


FIG.8



RF TUNER

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.2VDC	0V.	6.3VAC	0V.	125VDC	125VDC	0V.		
V 2	6AG5	-.2VDC	1.1VDC	6.3VAC	0V.	143VDC	143VDC	1.1VDC		
V 3	6J6	140VDC	95VDC	0V.	6.3VAC	-3.4VDC	§-3.7VDC	0V.		
V 4	6BA6	-3VDC	0V.	0V.	6.3VAC	120VDC	120VDC	1.4VDC		
V 5	6BA6	.2VDC	0V.	0V.	6.3VAC	130VDC	130VDC	1.4VDC		
V 6	6AU6	18VDC	0V.	0V.	6.3VAC	175VDC	175VDC	20VDC		
V 7	6AG5	0V.	2.4VDC	0V.	6.3VAC	175VDC	175VDC	2.4VDC		
V 8	6AL5	¶0V.	0V.	6.3VAC	0V.	0V.	0V.	¶-3.2VDC		
V 9	6AQ5	¶-3.2VDC	¶10VDC	0V.	6.3VAC	¶105VDC	¶125VDC	¶-3.2VDC		
V 10	12AU7	¶150VDC	¶-25VDC ¶-55VDC	¶.6VDC	6.3VAC	6.3VAC	63VDC	-12VDC	0V.	0V.
V 11	6AU6	-.1VDC	.5VDC	0V.	6.3VAC	95VDC	95VDC	.5VDC		
V 12	6AU6	-.3VDC	0V.	0V.	6.3VAC	7.7VDC	62VDC	0V.		
V 13	6AL5	.3VDC	0V.	0V.	6.3VAC	.3VDC	0V.	.3VDC		
V 14	6AU6	-.5VDC	0V.	0V.	6.3VAC	125VDC	30VDC	0V.		
V 15	6Y6G	0V.	0V.	145VDC	125VDC	0V.	0V.	6.3VAC	10VDC	
V 16	12AX7	¶250VDC	¶40VDC	¶45VDC	0V.	0V.	¶300VDC	¶40VDC	¶45VDC	6.3VAC
V 17	12AU7	¶20VDC	¶0V.	¶0V.	6.3VAC	6.3VAC	55VDC	.2VDC	0V.	0V.
V 18	6AQ5	¶0V.	¶20VDC ¶32VDC	0V.	6.3VAC	¶290VDC	¶290VDC	¶0V.		
V 19	6AL5	0V.	-7.8VDC	1.2VAC	6.3VAC	.1VDC	0V.	0V.		
V 20	6AU6	-.8VDC	0V.	0V.	6.3VAC	175VDC	175VDC	0V.		
V 21	12AU7	175VDC	-7.3VDC	.1VDC	0V.	0V.	¶125VDC ¶250VDC	¶20VDC	¶35VDC	6.3VAC
V 22	6BD5GT	¶-10VDC	0V.	¶0V.	0V.	*	0V.	6.3VAC	¶290VDC	
V 23	6W4GT	0V.	0V.	*	185VDC	0V.	185VDC	♦	♦	
V 24	6SN7GT	¶-15VDC	¶300VDC	¶2.1VDC	¶-15VDC	¶300VDC	¶2.1VDC	0V.	6.3VAC	
V 25	1B3GT	* DO NOT MEASURE.								
V 26	7X6	6.3VAC	200VDC	210VAC	130VAC	130VAC	210VAC	200VDC	0V.	
V 27	5U4G	0V.	200VDC	0V.	120VAC	0V.	220VAC	0V.	200VDC	
V 28	10MP4	6.3VAC	-100VDC	PIN 11 -80VDC	PIN 12 0V.					

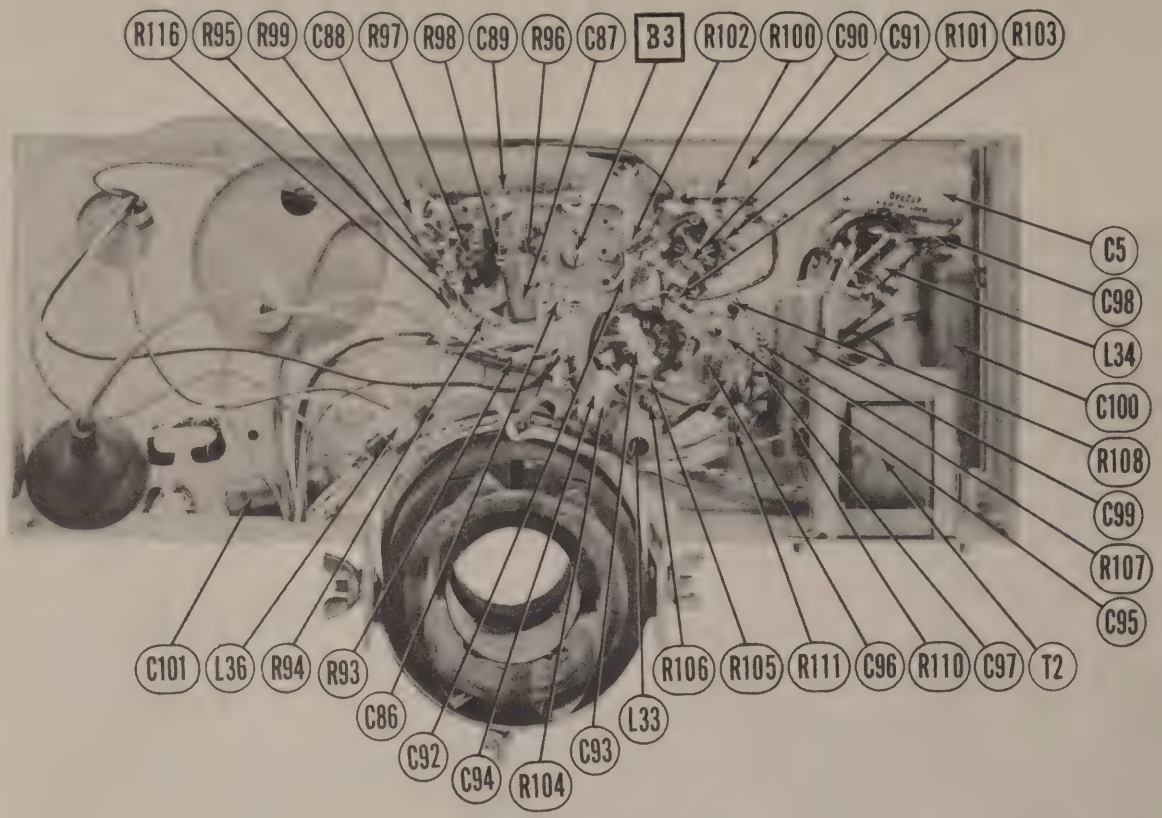
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	120KΩ	0Ω	.1Ω	0Ω	†2.2KΩ	†2.2KΩ	0Ω		
V 2	6AG5	10KΩ	100Ω	.1Ω	0Ω	†1.2KΩ	†1.2KΩ	100Ω		
V 3	6J6	†1000Ω	†10KΩ	0Ω	.1Ω	100KΩ	10KΩ	0Ω		
V 4	6BA6	27KΩ	0Ω	0Ω	.1Ω	†4KΩ	†4KΩ	82Ω		
V 5	6BA6	25KΩ	0Ω	0Ω	.1Ω	†4KΩ	†4KΩ	82Ω		
V 6	6AU6	4.7KΩ	0Ω	0Ω	.1Ω	†380Ω	†380Ω	2.2KΩ		
V 7	6AG5	.5Ω	150Ω	0Ω	.1Ω	†280Ω	†280Ω	150Ω		
V 8	6AL5	¶100Ω	25KΩ	.1Ω	0Ω	0Ω	0Ω	¶4KΩ		
V 9	6AQ5	¶4KΩ	¶1000Ω	0Ω	.1Ω	†17KΩ	0Ω	¶4KΩ		
V 10	12AU7	†320KΩ	¶1.3 Meg. ¶270KΩ	¶1.2KΩ	.1Ω	.1Ω	†14KΩ	¶2.2Meg.	0Ω	0Ω
V 11	6AU6	47KΩ	68Ω	0Ω	.1Ω	†10KΩ	†10KΩ	68Ω		
V 12	6AU6	47KΩ	0Ω	0Ω	.1Ω	†100KΩ	†22KΩ	0Ω		
V 13	6AL5	68KΩ	4Ω	0Ω	.1Ω	Inf.	0Ω	Inf.		
V 14	6AU6	10 Meg.	0Ω	0Ω	.1Ω	†100KΩ	†1.5 Meg.	0Ω		
V 15	6Y6G	0Ω	0Ω	†650Ω	†6KΩ	470KΩ	Inf.	.1Ω	180Ω	
V 16	12AX7	†820KΩ	13KΩ	¶1 Meg.	0Ω	0Ω	†18KΩ	13KΩ	¶2.2 Meg.	.1Ω
V 17	12AU7	†270KΩ	4.8 Meg.	¶0Ω	.1Ω	.1Ω	†22KΩ	†1.5 Meg.	0Ω	0Ω
V 18	6AQ5	¶2 Meg. ¶1 Meg.	¶6KΩ ¶1000Ω	0Ω	.1Ω	†1.8KΩ	†1.8KΩ	¶2 Meg. ¶1 Meg.		
V 19	6AL5	0Ω	1.1 Meg.	2Ω	.1Ω	200KΩ	0Ω	1.1 Meg.		
V 20	6AU6	1.2 Meg.	0Ω	0Ω	.1Ω	†200Ω	†2.4KΩ	0Ω		
V 21	12AU7	†190Ω	100KΩ	10Ω	0Ω	0Ω	†290KΩ †60KΩ	¶2.2 Meg.	¶56KΩ	.1Ω
V 22	6BD5GT	¶10 Meg.	0Ω	¶0Ω	Inf.	†2.3KΩ †360Ω	Inf.	.1Ω	†2.2KΩ †200Ω	
V 23	6W4GT	0Ω	Inf.	†2.3KΩ †360Ω	†120Ω	0Ω	†85Ω	Inf.	Inf.	
V 24	6SN7GT	¶3.9KΩ	†80Ω	¶54Ω	¶4KΩ	†80Ω	¶54Ω	0Ω	.1Ω	
V 25	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP †650Ω
V 26	7X6	.1Ω	32KΩ	190Ω	6Ω	6.5Ω	190Ω	32KΩ	0Ω	
V 27	5U4G	Inf.	32KΩ	Inf.	10.5Ω	Inf.	11Ω	Inf.	32KΩ	
V 28	10MP4	.1Ω	1 Meg.	PIN 11 3.3KΩ	PIN 12 0Ω					

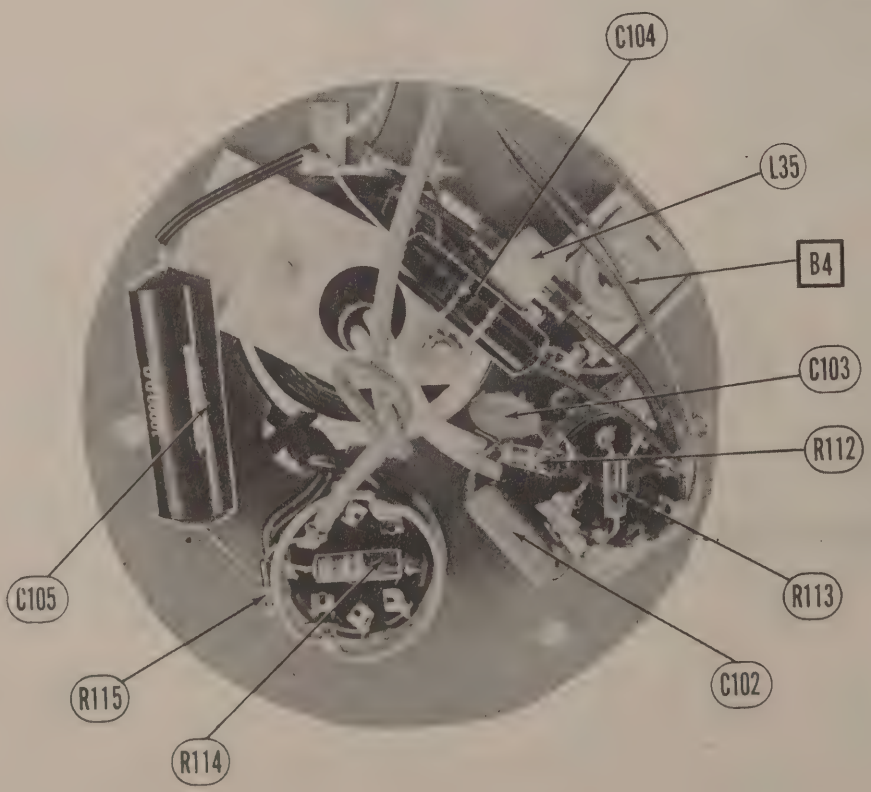
§ TAKEN WITH VACUUM TUBE VOLTMETER.
¶ MEASURED FROM PIN 3 OF V22.
* DO NOT MEASURE.
♦ 6.3 VAC MEASURED ACROSS FILAMENTS.

† MEASURED FROM PIN 8 OF V27.
¶ MEASURED FROM PIN 3 OF V22.

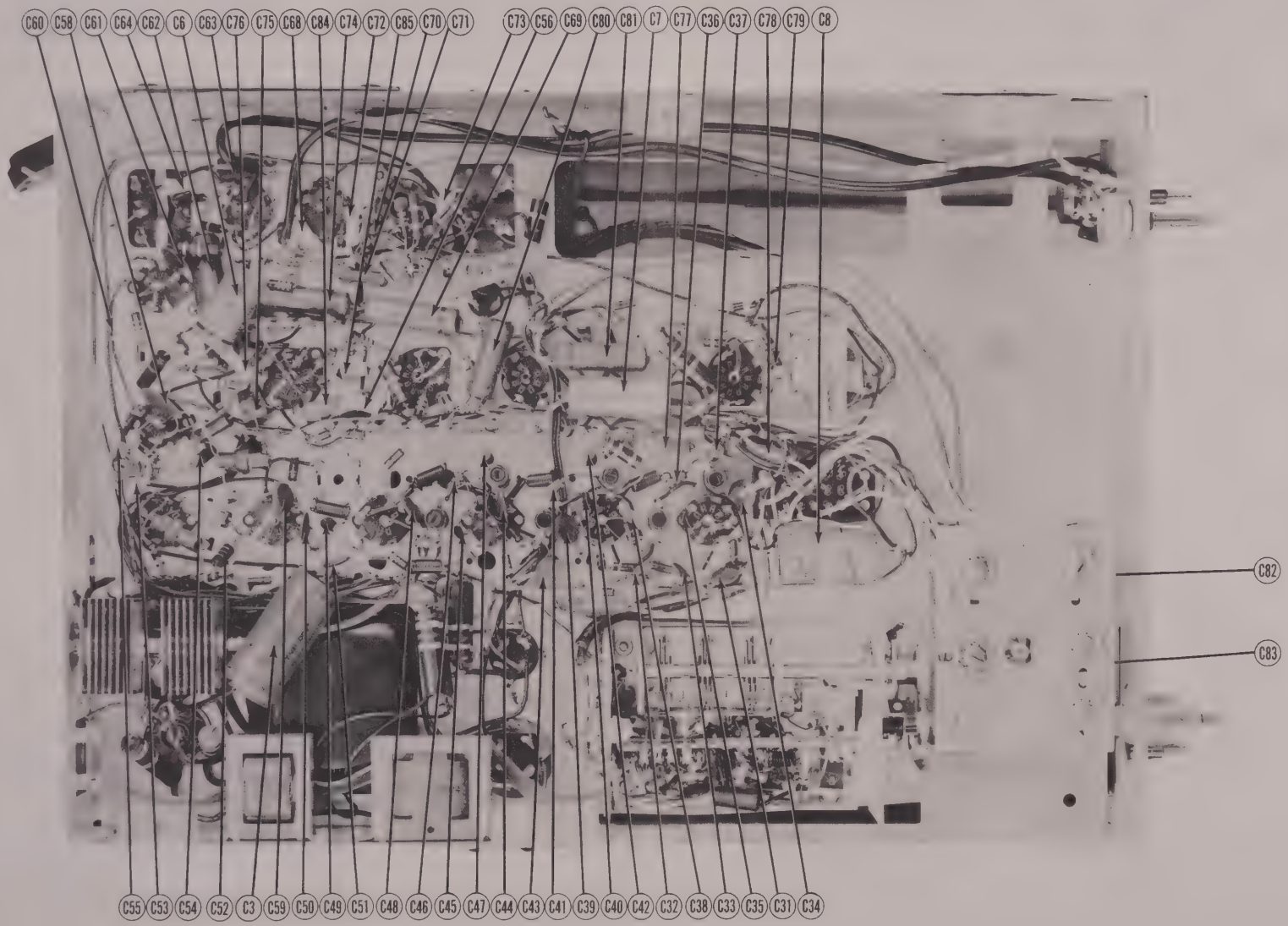
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



DEFLECTION SUB-CHASSIS



HIGH VOLTAGE SUPPLY-BOTTOM VIEW



CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	1st RF Amp.	623-0001	6AG5	7BD	
V2	2nd RF Amp.	623-0001	6AG5	7BD	
V3	Converter	623-0002	6J6	7BF	
V4	1st Video IF	623-0004	6BA6	7BK	
V5	2nd Video IF	623-0004	6BA6	7BK	
V6	3rd Video IF	623-0005	6AU6	7BK	
V7	4th Video IF	623-0001	6AG5	7BD	
V8	Video Det. - AGC Clamper	623-0003	6AL5	6BT	
V9	Video Output	623-0007	6AQ5	7BZ	
V10	AGC Amp. -Vert. Osc.	623-0006	12AU7	9A	
V11	Sound IF	623-0005	6AU6	7BK	
V12	Limiter	623-0005	6AU6	7BK	
V13	Ratio Det.	623-0003	6AL5	6BT	
V14	AF Amp.	623-0005	6AU6	7BK	
V15	Audio Output	622-0006	6Y6G	7AC	
V16	Sync. Sep.	623-0008	12AX7	9A	
V17	Sync. Clipper	623-0006	12AU7	9A	
V18	Vert. Output	623-0007	6AQ5	7BZ	
V19	Hor. Sync. Disc.	623-0003	6AL5	6BT	
V20	Hor. AFC	623-0005	6AU6	7BK	
V21	Hor. Osc. -Hor. Disch.	623-0006	12AU7	9A	
V22	Hor. Output	622-0007	6BD5GT	6CK	
V23	Damper	633-0004	6W4GT	4CG	
V24	HV Oscillator	622-0005	6SN7GT	8BD	
V25	HV Rectifier	633-0002	1B3GT	3C	
V26	LV Rectifier	632-0003	7X6	7AJ	
V27	LV Rectifier	633-0003	5U4G	5T	
V28A	Picture Tube	642-0001	10MP4	12G	
B	Picture Tube	642-0002	12VP4	12G	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	250	161-4001	AF16128F4D		TVL-405	▬ Filter
B	60	250					■ Decoupling
C	40	250					▲ Filter
D	20	150					Output Decoupling
C2A	40	250	161-2001	AF83G4A		TVL-204	■ Filter
B	25	25					▲ Output Cathode Bypass
C3	60	250	161-1003	PRS250/40		EL-6 ♦	Filter
C4A	10	450	161-4000	AF2J2G12E20B		TVL-404	▬ Vert. Output Decoupling
BB	10	300					■ Vert. Osc. Decoupling
C	60	200					▲ Filter
D	100	50					Vert. Output Cathode Bypass
C5	20	250	161-1005	PRS250/20		UT-202	Hor. AFC Screen Bypass
C6	2	50	161-1001	PRS150/4		TVA-12	Stabilizing Cap.
C7	10	12	161-1004	E26A230		TVA-5	AGC Filter
C8	100	50	161-1002	PRS50/100		TVA-17	Hor. Cent. Cont. Bypass
C9	50			GP50M	GP1K-50		RF Coupling
C10	1500			GP1500M	GP2L-0015		AGC Filter
C11	5000			BPD-5	811-005	29C1	1st RF Decoupling
C12	5000			BPD-5	811-005	29C1	1st RF Decoupling
C13	5000			BPD-5	811-005	29C1	1st RF Filament Bypass
C14	13			CN13JNPO	NPOK-13		Fixed Padder
C15	4.7			CI4.7DNPO	NPOK-4.7		Fixed Padder
C16	100			GP100M	GP1K-100		Fixed Padder
C17	5000			BPD-5	811-005	29C1	2nd RF Decoupling
C18	5000			BPD-5	811-005	29C1	2nd RF Decoupling
C19	680			GP680M	GP2K-680		2nd RF Cathode Bypass
C20	5000			BPD-5	811-005	29C1	2nd RF Filament Bypass
C21	14			CN14JNPO	NPOK-14		Fixed Padder
C22	100			GP100M	GP1K-100		RF Coupling
C23	2.2						Osc. Coupling
C24	30			GP30K	GP1K-33		Osc. Grid Cap.
C25	19			CN19JNPO	NPOK-20		Fixed Padder
C26	17.5			CN17.5JNPO	NPOK-17.5		Fixed Padder
C27	10			CN10DNPO	NPOK-10		Fixed Padder *
C28	10			CN10DNPO	NPOK-10		Fixed Trimmer
C29	5000			BPD-5	811-005	29C1	RF Bypass
C30	100			GP100M	GP1K-100		IF Coupling
C31	5000		166-5000D	BPD-5	811-005	29C1	RF Bypass
C32	5000		166-5000D	BPD-5	811-005	29C1	AGC Filter
C33	5000		166-5000D	BPD-5	811-005	29C1	AGC Filter
C34	5000		166-5000D	BPD-5	811-005	29C1	1st V. IF Decoupling
C35	1000		166-1000D	GP1000M	GP2L-001	29C4	1st V. IF Fil. Bypass
C36	.68		168-0004P				IF Coupling
C37	10		166-0010P	CN10DNPO	NPOK-10	MS-41	Fixed Padder
C38	5000		166-5000D	BPD-5	811-005	29C1	AGC Filter
C39	5000		166-5000D	BPD-5	811-005	29C1	2nd V. IF Decoupling
C40	1000		166-1000D	GP1000M	GP2L-001	29C4	2nd V. IF Fil. Bypass
C41	1.5		168-0001P	CI1.5CNPO	NPOK-1.5		IF Coupling
C42	10		166-0010P	CN10DNPO	NPOK-10	MS-41	Fixed Trimmer #
C43	5000		166-5000D	BPD-5	811-005	29C1	Bias Filter
C44A	4000		168-0003D	BPD-5	811-005	36C2	3rd V. IF Decoupling
B	4000			BPD-5	811-005		3rd V. IF Cathode Bypass
C45	1000		166-1000D	GP1000M	GP2L-001	29C4	3rd V. IF Filament Bypass
C46	.68		168-0004P				IF Coupling
C47	6		166-0006P	CN6CNPO	NPOK-6.8		Fixed Trimmer §
C48A	4000		168-0003D	BPD-5	811-005	36C2	4th V. IF Decoupling
B	4000			BPD-5	811-005		4th V. IF Cathode Bypass
C49	1000		166-1000D	GP1000M	GP2L-001	29C4	4th V. IF Fil. Bypass
C50	5000		166-5000D	BPD-5	811-005	29C1	RF Bypass
C51	5000		166-5000D	BPD-5	811-005	29C1	RF Bypass
C52	10		166-0010P	GP10K	NPOK-10	MS-41	V. Diode Filter
C53	5		168-0005P	CM5DNPO	NPOK-5	MS-55	S.1F Coupling

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	ERIE PART No.	SPRAGUE PART No	IDENTIFICATION CODES AND INSTALLATION NOTES
C54	10		166-0010P	CN10DNPO	NPOK-10	MS-41	Fixed Trimmer
C55	58		166-0058N	CN56JNPO	NPOM-50	MS-45	Fixed Trimmer
C56	10000		168-0003N	GP10000M	821-01	TM-11	Pic. Tube Grid Filter
C57	5000		166-5000D	BPD-5	811-005	29C1	RF Bypass
C58A	4000		168-0003D	BPD-5	811-005	36C2	1st S. IF Decoupling
B	4000			BPD-5	811-005		1st S. IF Cathode Bypass
C59	5000		166-5000D	BPD-5	811-005	29C1	V. Det.-AGC Clamp Fil. Bypass
C60	50		166-0050N	GP50M	GP1K-50	1FM-45	2nd S. IF Grid Filter
C61	5000		166-5000D	BPD-5	811-005	29C1	2nd S. IF Screen Bypass
C62	.2	400	162-0402	P488-32		TC-2	2nd S. IF Plate Decoupling
C63	680		163-0680	GP680M	GP2K-680	1FM-37	De-emphasis
C64	10000		168-0003N	GP10000M	821-01	TM-11	Audio Coupling
C65	50	500	163-0050	1468-00005	GP1K-50	1FM-45	Tone Compensation †
C66	200	500	163-0200	1469-0002	GP2K-200	1FM-32	Tone Compensation †
C67	10000		†	GP10000M	821-01	TM-11	Tone Compensation
C68	10000		168-0003N	GP10000M	821-01	TM-11	Audio Coupling
C69	.1	200	162-0601	P288-1		TM-1	AF Amp. Screen Bypass
C70	100		168-0100P	GP100M	GP1K-100	1FM-31	AF Amp. Plate Bypass
C71	2000		166-2000P	GP2000M	GP2M-002	1FM-22	Tone Compensation †
C72	10x00		168-0002N	GP10000M	821-01	TM-11	Audio Coupling
C73	10000		168-0003N	GP10000M	821-01	TM-11	Output Plate DBypass
C74	.1	200	162-0601	P288-1		TM-1	Vert. Sync. Sep. Cathode Bypass
C75	220	500	163-0220	1468-00025	GP2K-220	1FM-325	Vert. Sync. Sep. Plate Bypass
C76	10000		168-0002N	GP10000M	821-01	TM-11	Vert. Sync. Coupling
C77	1000	500	163-1000	1468-001	GP2L-001	1FM-21	Vert. Sync. Coupling
C78	.015	400	162-0415	P486-015			Integrator Net.
C79	250		166-0250P	GP250M	GP2K-350	1FM-325	Vert. Osc. Grid Cap.
C80	.05	200	162-0615	P288-05		TM-15	Decoupling
C81	.1	200	162-0601	P288-1		TM-1	Vert. Discharge
C82	.1	200	162-0601	P288-1		TM-1	Vert. Sweep Coupling
C83	.02	400	162-0613	P488-02		TM-12	Vert. Discharge
C84	.002	600	162-0633	P688-002	GP2M-002	TM-22	Hor. Sync. Sep. Cathode Bypass
C85	500		166-0500P	GP500M	GP2K-500	1FM-35	Hor. Sync. Coupling
C86	100		168-0100P	GP100M	GP1K-100	1FM-31	Hor. Sync. Coupling
C87	.005	400	162-0625	P488-005	811-005	TM-35	Fixed Trimmer
C88	10000		168-0002N	GP10000M	821-01	TM-11	AFC Filter
C89	.2	400	162-0402	P488-32		TC-2	AFC Filter
C90	.015	400	160-42115	P488-015			Fixed Trimmer
C91	100		168-0100P	GP100M	GP1K-100	1FM-31	Phase Shifter
C92	5000		166-5000D	BPD-5	811-005	29C1	Hor. Osc. Grid Cap.
C93	10000		168-0002N	GP10000M	821-01	TM-11	Hor. Sweep Coupling
C94	10000		168-0002N	GP10000M	821-01	TM-11	Hor. Discharge Cathode Bypass
C95	680	500	163-0680		GP2K-680	1FM-37	Hor. Discharge
C96	5000		166-5000D	BPD-5	811-005	29C1	Hor. Discharge Plate Decoupling
C97	1000		166-1000D	GP1000M	GP2L-001	1FM-21	Hor. Sweep Coupling
C98	50	500	162-0050	1468-00005	GP1K-50	1FM-45	RF Bypass
C99	.1	600	162-0601	P688-1		TM-1	Hor. Sweep Coupling
C100	.2	400	162-0402	P488-32		TC-2	RF Bypass
C101	.05	200	162-0615	P288-05		TM-15	Decoupling
C102	1500	500	163-1500	1467-1500	GP2L-0015	1FM-315	Fixed Trimmer
C103	5000		166-5000D	BPD-5	811-005	29C1	HV Osc. Grid Cap.
C104	.022	400	160-42123	P488-022		TM-12	HV Osc. Cathode Bypass
C105	.0005	10000	160-14350			TVM-351	HV Filter

* Use mounting strap.
• Some models use 13MMF in this application.
† Items C87 and R62 are combined into one unit obtainable under MFGR'S Part No. 190-0002.
‡ Not used in model 1-177.
◆ Model 1-177 uses 8MMF in this application. MFGR'S Part No. 166-0008N.
§ Model 1-177 uses 4.7 MMF in this application. MFGR'S Part No. 168-0008N.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	154-0001		70729	Volume Control, panel, tapped at 200KΩ and 350KΩ Note 2
B	1 Meg.	½				Tone Control, rear-See note 2
R2A	1000Ω	2	155-0003		70910	Contrast Control, panel-Wire Wound-See Note 3
B	100KΩ	½				Brightness Control-Rear
R3	1 Meg.	½	153-0001	QII-137	70819	Vert. Hold Control
R4	1 Meg.	½	153-0001	QII-137	70818	Vert. Size Control
R5	500KΩ	½	153-0002	QII-133	M-58-S	Horiz. Linearity Control
R6	140Ω	2	153-3002		70824	Horiz. Centering Control, tapped at 70Ω, Wire Wound
R7	5000Ω	2		W-5000	43-5000	Vert. Linearity Control-Wire Wound-See Note 1
R8	2000Ω	2	153-3001	W-2000	70823	Horiz. Size Control-Wire Wound

Note 1. Some models use 1000Ω, 2 watt control, Part No. 153-3000.
Note 2. Model 1-177 does not use a tone control, the volume control Part No. is 152-0007.
Note 3. Model 1-177 use a single contrast control Part No. 153-3003, and a single brightness control Part No. 153-0005.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R9	560Ω	½			1st RF Grid
R10	150Ω	½			AGC Network
R11	1200Ω	½		BTS-1200	1st RF Plate
R12	1000Ω	½		BTS-1000	1st RF Decoupling
R13	10KΩ	½			2nd RF Grid
R14	100Ω	½			2nd RF Cathode
R15	1500Ω	½		BTS-1500	2nd RF Plate
R16	220Ω 20%	½			2nd RF Decoupling
R17	5600Ω	½		BTS-5600	Conv. Grid
R18	100KΩ 20%	½		BTS-100K	Conv. Grid
R19	10KΩ	½		BTS-10K	Conv. Plate Decoupling
R20	10KΩ 20%	½		BTS-10K	Osc. Grid
R21	1000Ω	2	183-0102	BT-2-1000	Decoupling
R22	3.3 Meg.	½	181-0335	BTS-3.3 Meg.	Voltage Divider
R23	100KΩ	½	181-0104	BTS-100K	AGC Network
R24	1000Ω 20%	½	181-0102	BTS-1000	AGC Network
R25	1500Ω	½	181-0152	BTS-1500	1st Video IF Grid

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA PART No.	IRC PART No.	IDENTIFICATION CODES
R26	82Ω	½	181-0820		1st Video IF Cathode
R27	3900Ω	1	182-0392	BTS-3900	1st Video IF Decoupling
R28	1000Ω 20%	½	181-0102	BTS-1000	AGC Network
R29	2700Ω	½	181-0272	BTS-2700	2nd Video IF Transformer Shunt
R30	82Ω	½	181-0820		2nd Video IF Cathode
R31	3900Ω	1	182-0392	BTA-3900	2nd Video IF Decoupling
R32	39KΩ	½	181-0393		IF Trap Coil Shunt
R33	15KΩ	½	181-0153		3rd Video IF Transformer Shunt
R34	2200Ω	½	181-0222	BTS-2200	3rd Video IF Cathode
R35	100Ω 20%	½	181-0101		3rd Video IF Decoupling
R36	15KΩ	½	181-0153		4th Video IF Transformer Shunt
R37	150Ω	½	181-0151		4th Video IF Cathode
R38	100Ω 20%	½	181-0101		4th Video IF Decoupling
R39	5600Ω	½	181-0562		5th Video IF Transformer Shunt
R40	22KΩ 5%	½	181-02235	BTS-22K-5%	Peaking Coil Shunt
R41	3900Ω 5%	½	181-0392	BTS-3900-5%	Video Det. Diode Load
R42	100Ω 20%	½	181-0101		Bias Network
R43	68Ω	½	181-0680		Video Output Cathode
R44	6800Ω	½	181-0682	BTS-6800	Sound Take-Off Coil Shunt
R45	100KΩ 20%	1	182-0104	BTA-100K	Video Output Plate
R46	3300Ω	2	183-0332	BT-2-3300	Picture Tube Cathode
R47	1 Meg. 20%	½	181-0106	BTS-1 Meg.	Voltage Divider
R48	33KΩ	½	181-0333	BTS-33K	Voltage Divider-See Note 4
R49	1 Meg.	½	181-0105	BTS-1 Meg.	AGC Amp. Grid-See Note 5
R50	18KΩ 5%	2	183-01835	BT-2-18K-5%	AGC Amp. Plate
R51	10KΩ 5%	1	182-0103	BTA-10K-5%	AGC Network
R52	22KΩ 5%	1	182-02235	BTA-22K-5%	Voltage Divider
R53	47KΩ 20%	½	181-0473		Sound IF Grid
R54	68Ω	½	181-0680		Sound IF Cathode
R55	10KΩ 20%	1	182-0103		Sound IF Decoupling
R56	47KΩ 20%	½	181-0473		Limiter Grid
R57	39KΩ	1	182-0393		Limiter Screen
R58	100KΩ 20%	½	181-0104		Limiter Plate Decoupling
R59	33KΩ 20%	½	181-0333	BTS-33K	Voltage Divider
R60	100KΩ 20%	½	181-0104	BTS-100K	De-emphasis
R61	68KΩ 20%	½	181-0683	BTS-68K	Disc. Diode Load
R62	82KΩ	½		BTS-82K	Tone Compensation-See Note 6
R63	10 Meg. 20%	½	181-0106	BTS-10 Meg.	AF Grid
R64	1.5 Meg. 20%	½	181-0155	BTS-1.5 Meg.	AF Screen
R65	100KΩ 20%	½	181-0104	BTS-100K	AF Plate
R66	470KΩ 20%	½	181-0774	BTS-470K	Output Grid
R67	180Ω	1	182-0181	BW-1-180	Output Cathode
R68	68Ω	½	181-0680		Parasitic Supp.
R69	5600Ω	2	183-0562	BT-2-5600	Bias Network
R70	22KΩ	1	182-0223	BTA-22K	Bias Network
R71	4700Ω	½	181-0472	BTS-4700	Voltage Divider
R72	400Ω	5	187-0001	AB-400	Filter-Wire Wound
R73	10KΩ 20%	½	181-0103	BTS-10K	Sync. Sep. Grid
R74	18KΩ	½	181-0183	BTS-18K	Sync. Sep. Plate
R75	10KΩ 20%	½	181-0103	BTS-10K	Sync. Sep. Grid
R76	820KΩ	½	181-0824	BTS-820K	Sync. Sep. Plate
R77	1 Meg.	½	181-0105	BTS-1 Meg.	Bias Network
R78	820KΩ	½	181-0824	BTS-820K	Sync. Clipper Grid
R79	3.9 Meg.	½	181-0395	BTS-3.9 Meg.	Sync. Clipper Grid
R80	270KΩ	½	181-0274	BTS-270K	Sync. Clipper Plate
R81	270KΩ	½	181-0274	BTS-270K	Vert. Osc. Grid
R82	1200Ω	½	181-0122	BTS-1200	Bias Network
R83	220KΩ 20%	½	181-0224	BTS-220K	Vert. Osc. Plate
R84	100KΩ 20%	½	181-0104	BTS-100K	Vert. Osc. Plate Decoupling
R85	22KΩ 20%	½	181-0223	BTS-22K	Vert. Osc. Transformer Shunt
R86	3900Ω 5%	½	181-0392	BTS-3900-5%	Vert. Peaking
R87	1 Meg.	½	181-0105	BTS-1 Meg.	Vert. Output Grid
R88	1000Ω 20%	½	181-0102	BTS-1000	Vert. Output Cathode
R89	1000Ω 20%	½	181-0102	BTS-1000	Vert. Output Decoupling
R90	1.5 Meg.	½	181-0155	BTS-1.5 Meg.	Sync. Clipper Grid
R91	22KΩ	1	182-0223	BTA-22K	Sync. Clipper Plate
R92	2.2 Meg.	½	181-0225	BTS-2.2 Meg.	Bias Network
R93	100KΩ 5%	½	181-0104	BTS-100K-5%	Bias Network
R94	33KΩ 5%	½	181-0333	BTS-33K-5%	Voltage Divider
R95	10 Meg. 5%	½	181-0106	BTS-10Meg. 5%	Voltage Divider
R96	1 Meg. 20%	½	181-0105	BTS-1 Meg.	Horiz. Sync. Disc. Load
R97	100KΩ	½	181-0104	BTS-100K	Horiz. Sync. Disc. Load
R98	100KΩ	½	181-0104	BTS-100K	Horiz. Sync. Disc. Load
R99	1 Meg. 5%	½	181-01055	BTS-1 Meg. 5%	Horiz. AFC Filter Network
R100	8200Ω	½	181-0822	BTS-8200	Horiz. AFC Filter Network
R101	1000Ω 20%	½	181-0102	BTS-1000	Horiz. AFC Grid
R102	2200Ω 20%	½	181-0222	BTS-2200	Horiz. AFC Screen
R103	100KΩ 20%	½	181-0104	BTS-100K	Horiz. Osc. Grid
R104	22KΩ 20%	½	181-0223	BTS-22K	Ringing Coil Shunt
R105	2.2 Meg. 20%	½	181-0225	BTS-2.2 Meg.	Horiz. Discharge Grid
R106	56KΩ	½	181-0563	BTS-56K	Horiz. Discharge Cathode
R107	39KΩ	½	181-0393	BTS-39K	Horiz. Discharge Plate
R108	4700Ω	½	181-0472	BTS-4700	Horiz. Peaking
R109	390KΩ	½	181-0394	BTS-390K	Voltage Divider
R110	82Ω	½	181-0820		Parasitic Supp.
R111	10 Meg.	½	181-0106	BTS-10 Meg.	Horiz. Output Grid
R112	3900Ω	½	181-0392	BTS-3900	HV Osc. Grid
R113	100Ω 20%	½	181-0101		Parasitic Supp.
R114	3.6Ω	½			HV Rect. Filament-Wire Wound
R115	470KΩ 20%	½	181-0474		HV Filter
R116	4.3Ω	½	189-0007		Horiz. Disc. Fialment-Wire Wound
R117	390Ω	2	183-0391		Surge Limiter
R118	390Ω	2	183-0391		Surge Limiter
R119	390Ω	2	183-0391		Surge Limiter
R120	390Ω	2	183-0391		Surge Limiter
R121	39Ω	2	183-0390		Surge Limiter
R122	39Ω	2	183-0390		Surge Limiter

Note 4. Some models use 56KΩ resistor in this application.
Note 5. Not used in all models.
Note 6. Items C67 and R62 are combined into one unit, obtainable under MFGR'S Part No. 190-0002

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ④ 2.19A	530VCT ④ .330 ADC & 360VCT ⑤ .200 ADC	5VAC ④ 3A	6.3VAC ④ 11.8A	141-0008			

TRANSFORMER (ISOLATION)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T2	6.3VAC ④ 1.66A	6.3VAC ④ 1.2A			240-0001		P-2944	

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T3	170Ω	575Ω	242-0001	A-8111	A-3000	TBO-1	Vert. Block Osc. Trans.
T4	160Ω		241-0002				Hor. Output Choke
	120Ω						
T5	620Ω		241-0001	A-8112 ②	A-3037	TSO-5	Vert. Output Trans.
	Tap ④ 6.1Ω						
T6A	36Ω		100-0001				Hor. Deflection Coil
B	60Ω						Vert. Deflection Coil

② Drill one new mounting hole.

TRANSFORMER (H.V. OSC.)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T7	1.5Ω	570Ω	18Ω	0Ω	113-0010			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T8	2.6KΩ	3.5Ω	250Ω	.5Ω	143-0009	A-3849	A-3018	RO-305	

SPEAKER

ITEM No.	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA SYLVANIA PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
SP1A	PM	3.5Ω	ST-803 ③			
B	PM		539-0500	MOD. P525-V	52A1 ③	③ Remount output transformer
			539-0800	ST-117 ④		
				MOD. P8-T	8A21 ③	
	CONE DIA.	V. C. DIA.				
SP2	5"	3/4"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.330A	22.5Ω	.6 Henry	145-0001	C-2326 ②		TR-3300 ②	② Drill one new mounting hole.
L2	.200A	60Ω	1.1 Henry	145-0002		C-2994	TR-4200	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SYLVANIA PART No.	MEISSNER PART No.	NOTES
L3	Ant. Coil	0Ω				Low-Band. Part of tuner.
L4	Ant. Coil	0Ω				High Band. Part of tuner.
L5	RF Coil	0Ω				Low-Band. Part of tuner.
L6	RF Coil	0Ω				High-Band. Part of tuner.
L7	RF Coil	0Ω				Low-Band. Part of tuner.
L8	RF Coil	0Ω				High-Band. Part of tuner.
L9	Osc. Coil	0Ω				Low-Band. Part of tuner.
L10	Osc. Coil	0Ω				High-Band. Part of tuner.
L11	Fil. Choke	0Ω				Part of tuner.
L12	RF Choke	0Ω				Part of tuner.
L13	1st Video IF	.5Ω				Part of tuner.
L14	Fil. Choke	0Ω		147-0014		
L15	Fil. Choke	0Ω		147-0014		

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF) CONT.

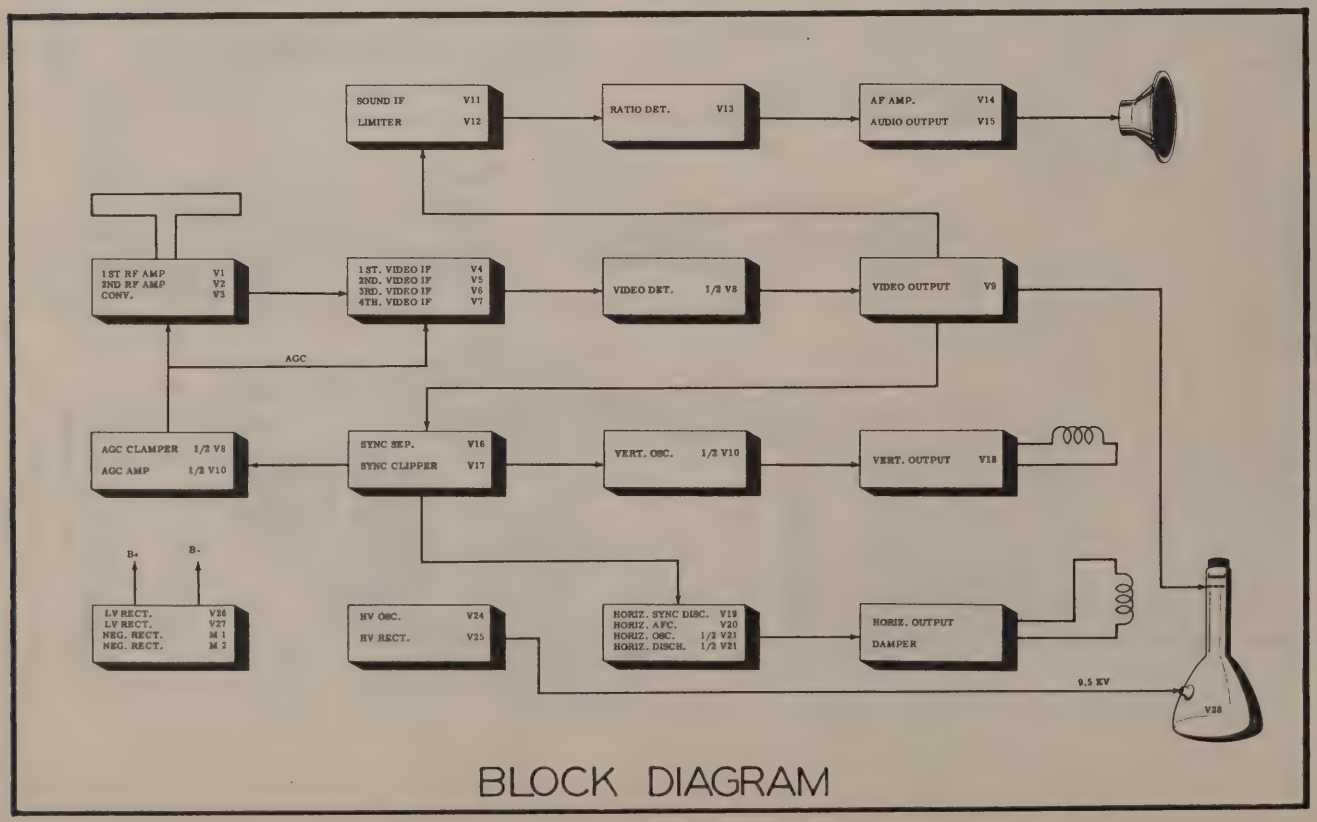
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	SYLVAMIA PART No.	MEISSNER PART No.	
L16	Adjacent Channel Picture Trap	.1Ω		118-0003		
L17	2nd Video IF	.5Ω	.5Ω	125-0001		
L18	Fil. Choke	0Ω		147-0014		
L19	Sound Trap	.1Ω		118-0003		
L20	3rd Video IF	.5Ω	.5Ω	125-0001		
L21	Fil. Choke	0Ω		147-0014		
L22	Adjacent Channel Sound Trap	.1Ω		118-0003		
L23	4th Video IF	.5Ω	.5Ω	125-0001		
L24	5th Video IF	.3Ω	1.1Ω	120-0002		
L25	Fil. Choke	0Ω		147-0014		
L26	Peaking	5Ω		146-0001		
L27	Peaking	7.6Ω		146-0002		
L28	Sound Take-Off & 4.5MC Trap	1.5Ω	5Ω	129-0001		
L29	Peaking	6.8Ω		146-0004		
L30	Sound IF	2.1Ω	2.1Ω	120-0001		
L31	Ratio Det. Transformer	2Ω	4.1Ω *	128-0002		* Resistance of entire secondary.
L32	Horiz. Sync. Disc. Trans.	66Ω	38Ω	128-0001		Other secondary resistance is 10Ω
L33	Ringing Coil	36Ω		146-0005		
L34	RF Choke	0Ω		147-0014		
L35	HV Osc. Cath. Choke	53Ω		146-0006		
L36	Decoupling Choke	53Ω		146-0006		

SELENIUM RECTIFIER

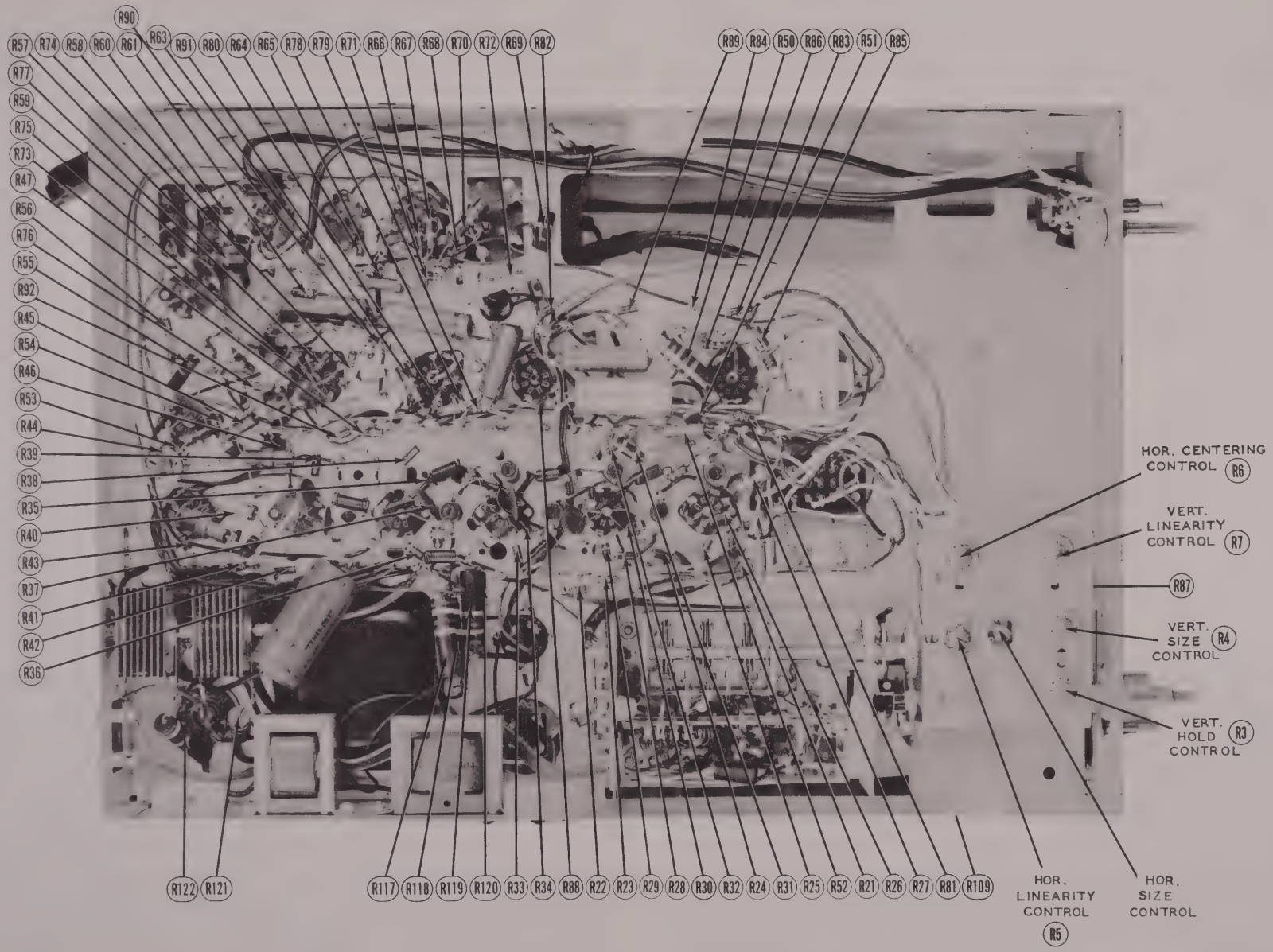
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	SYLVANIA PART No.	SYLVANIA PART No.		
M1	.200A	517-0001	NF-5		
M2	.200A	517-0001	NF-5		

MISCELLANEOUS

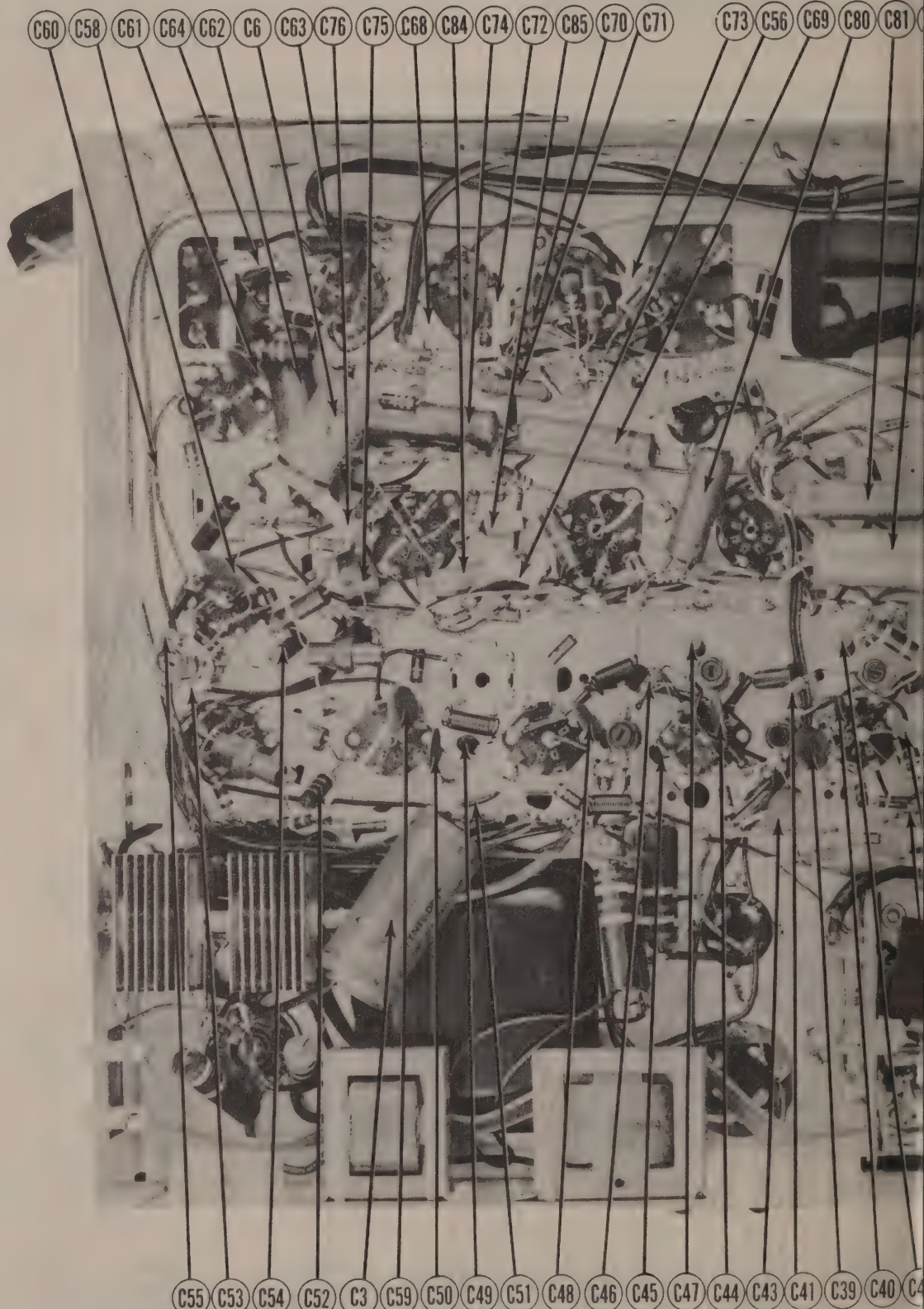
ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M3	RF Tuner	323-0001	
M4	Fuse	191-0005	Type AGC, .25A
M5	Ion Trap	400-0002	Permanent Magnet
M6	Switch	571-0001	On-Off
M7	Ant. Assembly	582-0002	
M8	Focus Magnet Assembly	400-0001	
	Knob	743-0001	Channel Assembly
	Knob	740-0001	Inner-Shaft
	Knob	744-0005	Outer-Shaft



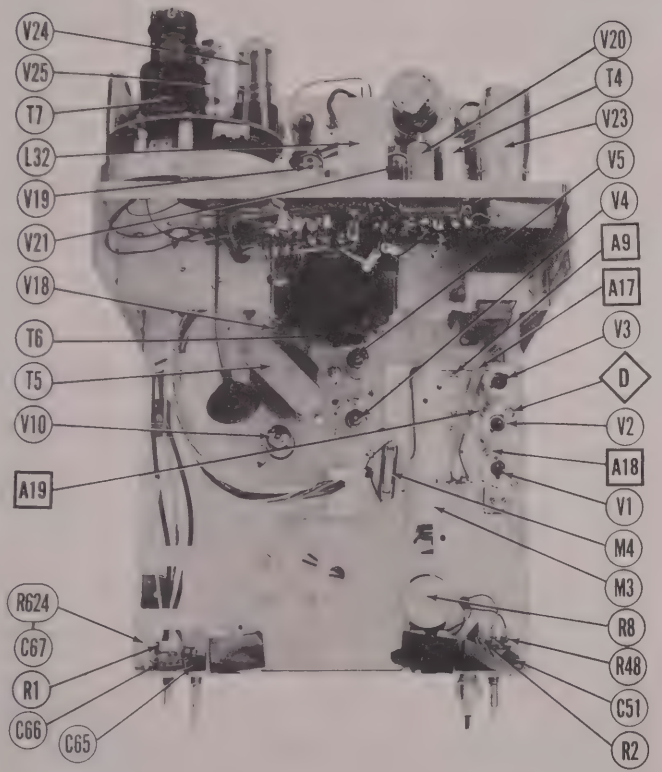
BLOCK DIAGRAM



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-



CHASSIS-TOP VIEW

HORIZONTAL LINEARITY ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.
Turn the horizontal size control until the picture is of proper width.
Turn the horizontal linearity control fully counter-clockwise, and then slowly clockwise until crowding is observed in the center of the picture. Then carefully turn the control counter-clockwise just enough to remove the crowding. On some sets the crowding may not be observed, in this case turn the control to maximum clockwise and leave it there. Caution: Do not operate the set for any length of time with this control incorrectly adjusted. Check the setting of the horizontal linearity control frequently during horizontal oscillator alignment.

HORIZONTAL OSCILLATOR ALIGNMENT

HORIZONTAL OSCILLATOR CHECK

a) Turn the set on and tune in a TV signal, preferably a test pattern. The picture should pull into sync.
b) Momentarily remove the signal by tuning to another channel and back again, the picture should fall back into sync.
c) Turn the set off for about 5 minutes, upon turning the set back on the picture should immediately fall back into sync.

SLIGHT RETOUCH ADJUSTMENT

If the oscillator failed any of the above check, it may be possible to correct it with a slight retouch adjustment as follows:
1) Remove the horizontal discriminator tube (V19) from its socket.
2) Adjust the horizontal frequency slug (B1) until the picture moves slowly back and forth across the screen with the blanking bar vertical.
3) Replace the horizontal discriminator tube (V19) in its socket.
4) Repeat the horizontal oscillator check, if the oscillator does not synchronize properly procede with complete horizontal oscillator alignment.

COMPLETE HORIZONTAL OSCILLATOR ALIGNMENT

a) Turn the core of the "ringing" coil (B2) fully out, (counter-clockwise), and short R108.
b) Remove the horizontal discriminator tube (V19) from its socket.
c) Adjust B1 until the picture moves slowly back and forth across the screen with the blanking bar vertical.
d) Replace V19 in its socket.
e) Turn the horizontal centering control until the edge of the picture can be seen. Turn the contrast down and the brightness up until the normally blanked edge of the raster is visable.
f) Adjust the horizontal phasing slug (B3) until the blanking bar is approximately 1/8 inch wide.
g) Remove the short from R108 and readjust the horizontal linearity control as outlined under "HORIZONTAL LINEARITY ADJUSTMENTS".
h) Adjust B2 until 1/8 inch of blanking bar is again visable.

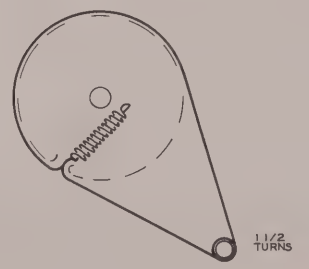
Check the oscillator pull in range as follows:
Turn B1 until the picture falls out of sync.
Slowly turn B1 back towards its original position and carefully note the number of bars present just before the picture falls back into sync. Repeat this check for both directions of rotation. If the number of bars present just before synchronization is less than 3 or more than 4 at either end of the pull in range, repeat the complete horizontal oscillator alignment. After completing this check, perform the slight retouch adjustment above.
Repeat the horizontal oscillator check.

HIGH VOLTAGE OSCILLATOR ADJUSTMENTS

Turn the contrast and brightness control to minimum.
Make sure the high voltage power supply cover is properly in place, and turn the high voltage trimmer (B4) to minimum capacity, (fully out).
Connect the high voltage probe of a VTVM to the high voltage lead from the power supply, connect the common lead to chassis. Turn B4 clockwise an d observe the reading on the meter, a peak voltage of approximately 12KV should be reached. Continue turning B4 clockwise until the meter reads 9.5KV, this is the proper setting for B4.
NOTE: The high voltage supply will provide a greatly reduced output if the high voltage fuse is blown.

DISASSEMBLY INSTRUCTIONS (MODEL 1-075)

1. Remove four push-on type control knobs. NOTE: Only outer knob of power switch comes off.
2. Remove six screws holding rear cover. Drop cover on hinges or remove staples holding hinges and remove cover completely.
3. Loosen antenna terminal screws. Remove built-in antenna leads.
4. Remove screw holding clamp over speaker corner . Remove clamp.
5. Remove six 5/16" hex head bolts holding chassis. Remove chassis.



CHANNEL SELECTOR DRIVE CORD STRINGING

PHOTOFACT* Folder

VIDEOLA MODELS VS-160, VS-161, VS-165, VS-166, VS-167, VS-168

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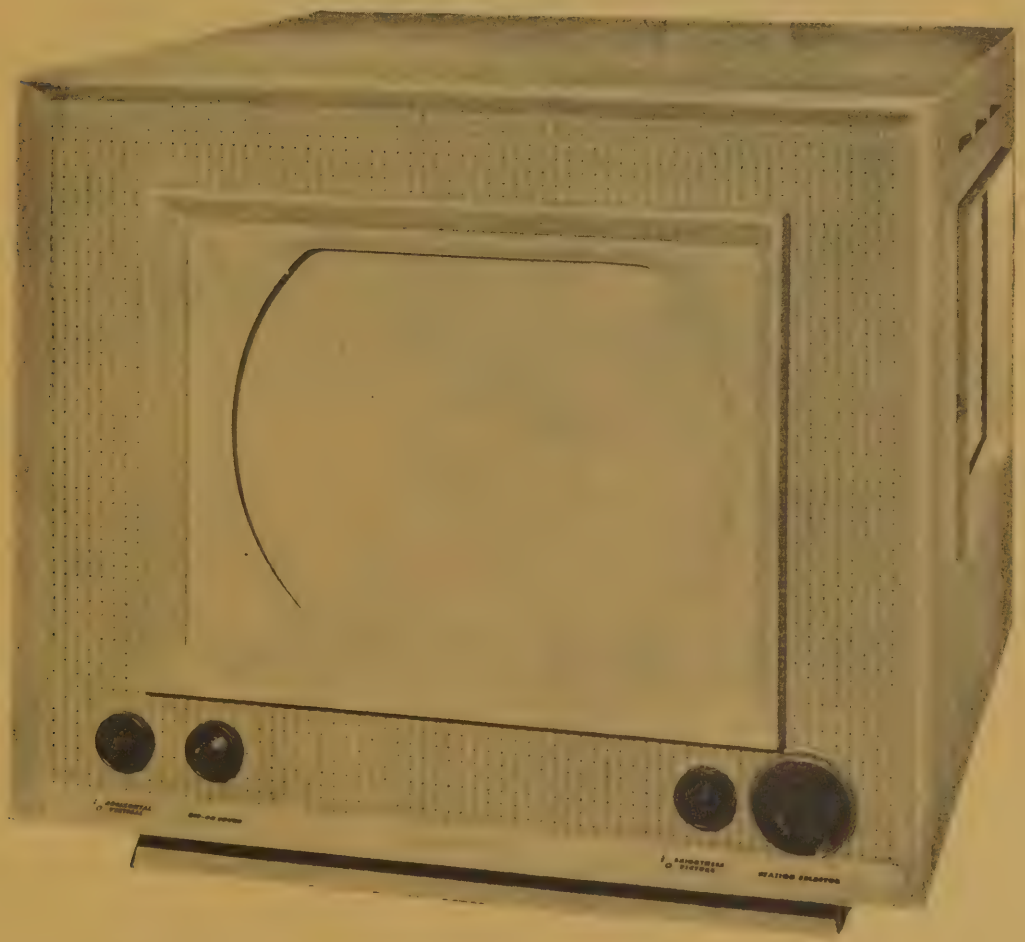

VIDEOLA MODELS VS-160, VS-161, VS-165, VS-166, VS-167, VS-168

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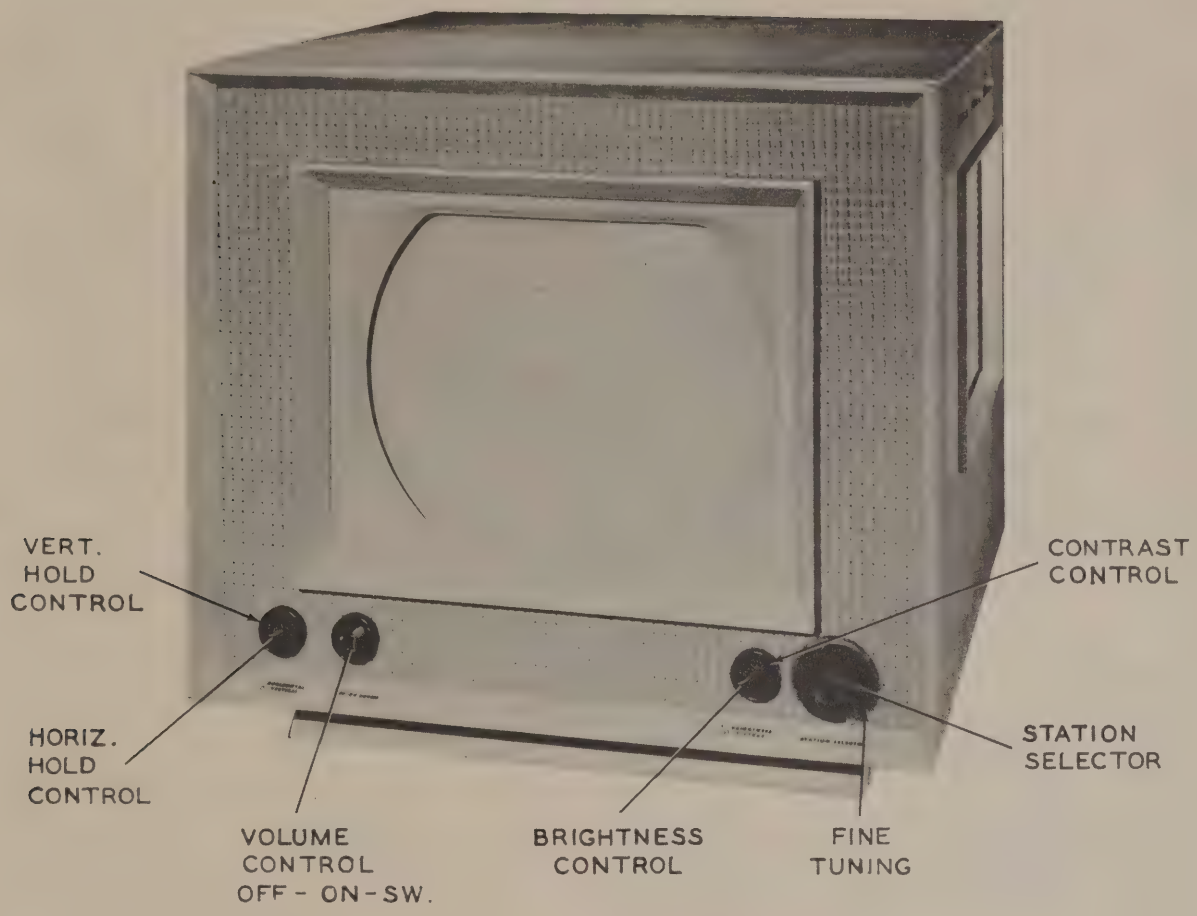
PHOTOFACT* Folder
*TRADE MARK

VIDEOLA MODELS VS-160, VS-161, VS-165, VS-166, VS-167, VS-168



VIDEOLA MODELS VS-160, VS-161, VS-165, VS-166, VS-167, VS-168

VIDEOLA MODEL VS-160

TRADE NAME	Videola Models VS-160, VS-161, VS-165, VS-166, VS-167, VS-168
MANUFACTURER	Video Corp. of America, 229 W. 28th St., New York 1, New York
TYPE SET	Television Receiver
TUBES	Nineteen
POWER SUPPLY	110-120 Volts AC - 60 Cycle
RATING	1.98 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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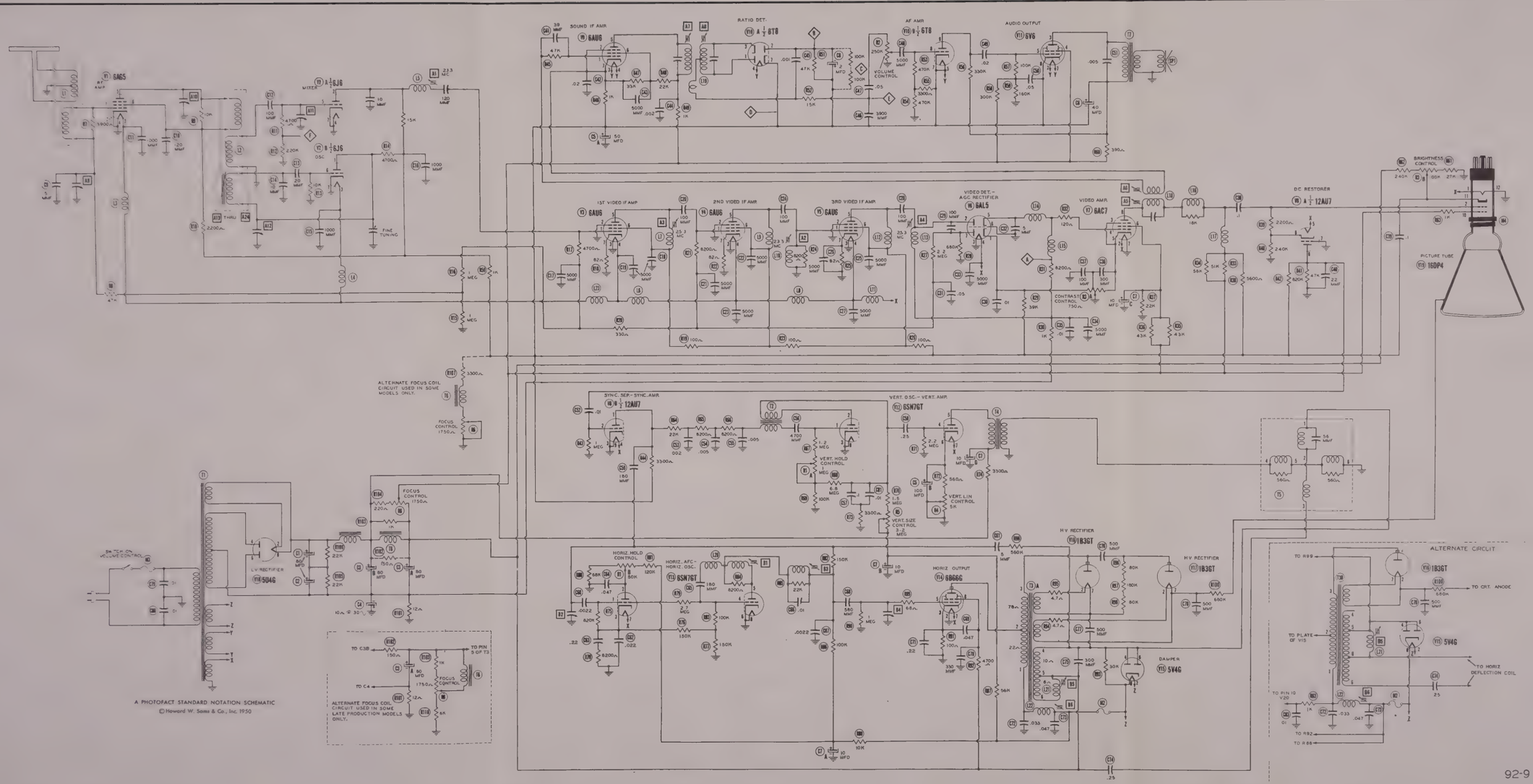
RF AMP V1 6AG5
MIXER V2A 6J6
OSC V2B 6J6
FINE TUNING
SOUND IF AMP V8 6AU6
RATIO DET. V10A 6T8
AF AMP V10B 6T8
VOLUME CONTROL
AUDIO OUTPUT V11 6V6
1ST VIDEO IF AMP V2 6AU6
2ND VIDEO IF AMP V4 6AU6
3RD VIDEO IF AMP V5 6AU6
VIDEO DET.- AGC RECTIFIER V6 6AL5
VIDEO AMP V7 6AC7
CONTRAST CONTROL 750Ω
DC RESTORER V6 A 12AU7
BRIGHTNESS CONTROL
PICTURE TUBE V13 16DP4
SYNC. SEP.- SYNC. AMP V6 B 12AU7
VERT. OSC.- VERT. AMP V12 6SN7GT
VERT. HOLD CONTROL
VERT. LIN CONTROL 5K
VERT. SIZE CONTROL 3-2 MEG
HORIZ. HOLD CONTROL
HORIZ. AFC.- HORIZ. OSC. V13 6SN7GT
HORIZ. OUTPUT V14 6BG6G
HV RECTIFIER V16 1B3GT
HV RECTIFIER V17 1B3GT
DAMPER V15 5V4G
ALTERNATE CIRCUIT
TO CRT ANODE
TO HORIZ DEFLECTION COIL
TO PLATE OF V15
TO PIN 10 V20
TO R89
TO R92
TO R88
ALTERNATE FOCUS COIL CIRCUIT USED IN SOME MODELS ONLY.
FOCUS CONTROL 1750Ω
LV RECTIFIER V19 5U4G
ON-OFF VOLUME CONTROL
TO C38
TO PIN 5 OF T3
TO C4
ALTERNATE FOCUS COIL CIRCUIT USED IN SOME LATE PRODUCTION MODELS ONLY.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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92-9

VIDEOLA MODELS VS-160, VS-161
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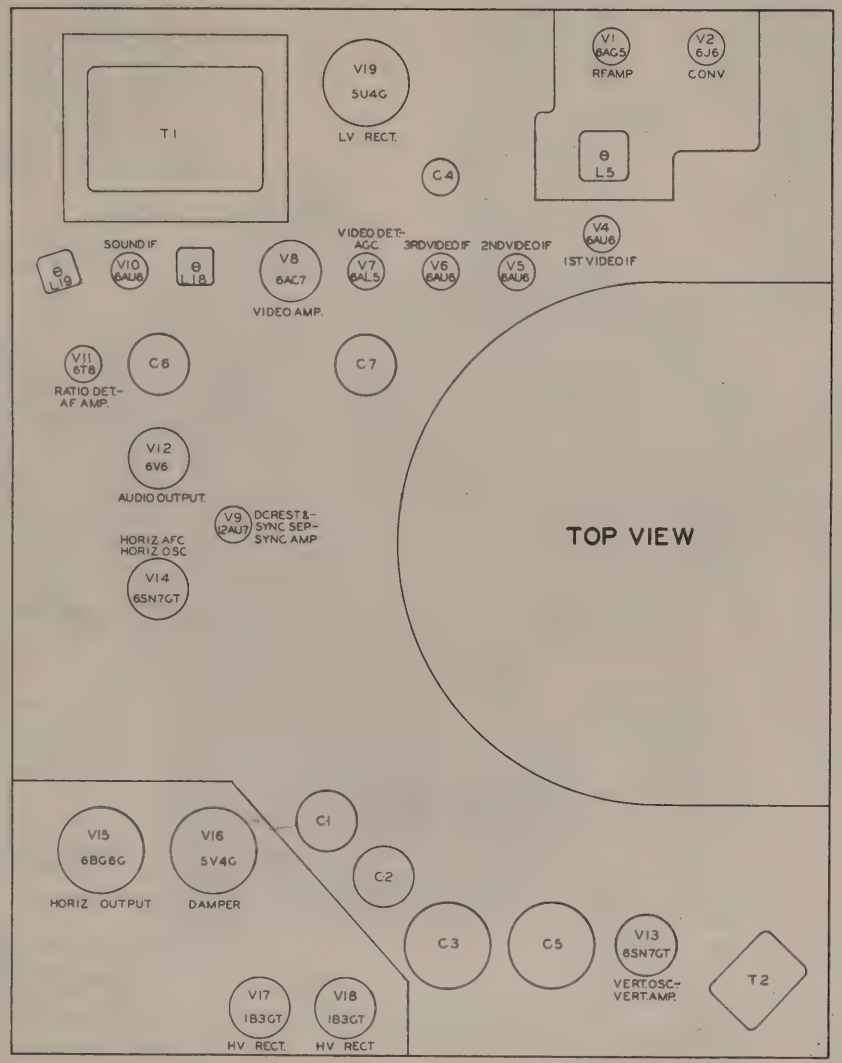
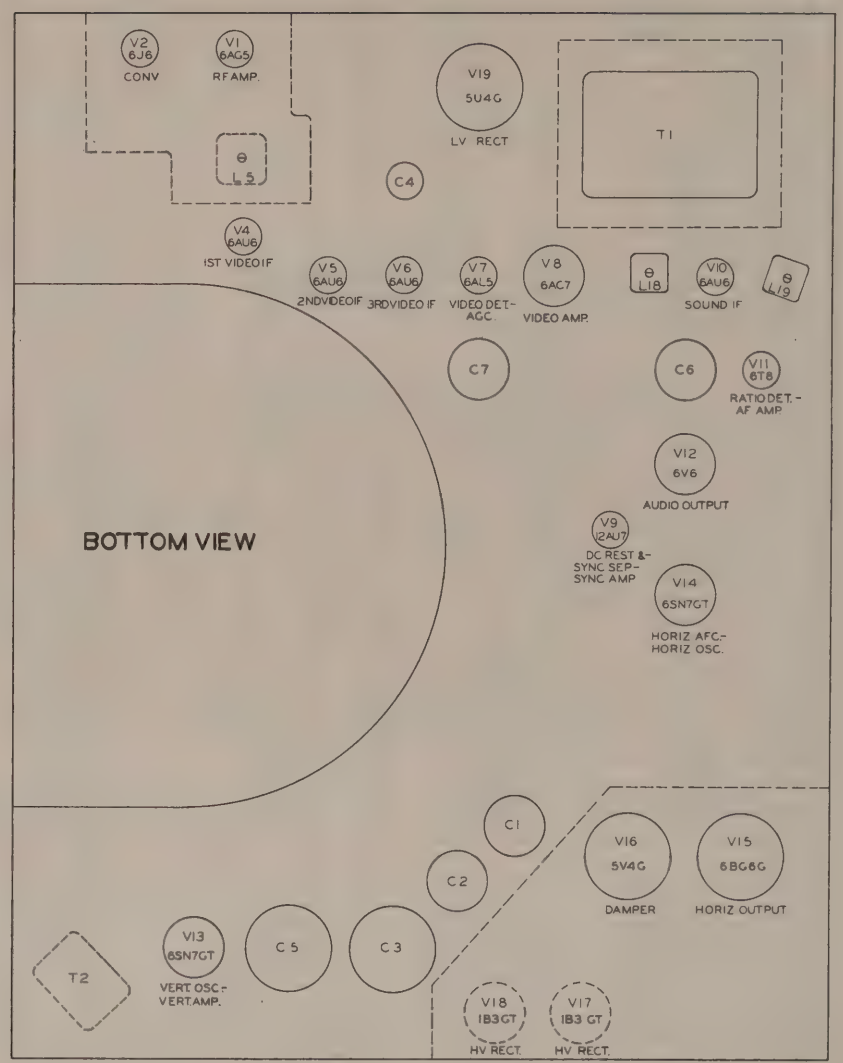
CHASSIS TOP VIEW

CHASSIS BOTTOM VIEW-TRANS.,INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

VIDEOLA MODELS VS-160, VS-161, VS-165, VS-166, VS-167, VS-168

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V13) from its socket.

VIDEO IF ALIGNMENT

Turn the contrast control to maximum clockwise.
Note that during video IF alignment the common lead of the VTVM is connected to approximately -2.5 volts, avoid grounding the VTVM case.
Remove the channel 13 segment of the converter section of the tuner turret and turn the channel selector switch to channel 13, to disable the local oscillator.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	23.3MC (Unmod.)	Any	DC Probe & Common leads across R31	A1, A2	Adjust for maximum deflection.
2.	Direct	"	25.3MC	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	24MC (10MC SWP)	21.25MC 22.9MC 23.4MC 24.9MC 25.75MC	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to Fig 1. If necessary retouch A1 thru A4 for optimum response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

During sound IF alignment the common lead of the VTVM is connected to approximately 140 volts with respect to chassis, avoid grounding or touching the VTVM case.
Connect a matched pair of 100KΩ resistors between Points (B) and (D). The junction of these two resistors is alignment Point C.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.001MFD	High side to pin 4 (Grid) of 6AC7 (V7). Low side to chassis.	4.5MC (Unmod.)	Any channel not used locally	DC Probe to Point (B). Common to Point (D).	A5, A6, A7	Adjust for maximum deflection.
5.	.001MFD	"	"	"	DC Probe to Point (E). Common to Point (C).	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal 3with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.001MFD	High side to pin 4 (Grid) of 6AC7 (V7). Low side to chassis.	4.5MC (450KC Sweep)	4.5MC	Any channel not used locally	Vert. Amp. to Point (B) Low side to chassis.	A5, A6 A7	Disconnect stabilizer capacitor C8. Adjust for maximum amplitude and symmetry as per Fig 2.
5.	.001MFD	"	"	"	"	Vert. Amp. to Point (E). Low side to chassis.	A8	Reconnect capacitor C8. Adjust A8 so 4.5MC occur at center of crossover lines as per Fig 3. Slightly retouch A7 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

Replace the channel 13 segment of the tuner turret.
The sweep generator output lead should be terminated with its characteristic impedance usually 50 ohms.
Turn the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon res.	Across antenna leads with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (F). Low side to chassis.	A9, A10, A11	Adjust for flat-topped response similar to Fig 4 with markers above 70%.
7.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check all channels for response similar to Fig 4. If markers fall below 70% on any channel, make slight adjustment of A9, A10, A11 with channel selector set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC1 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

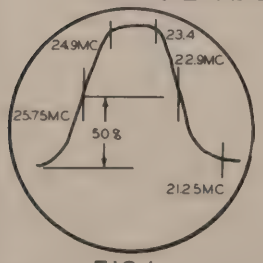


FIG. 1

FIG. 2

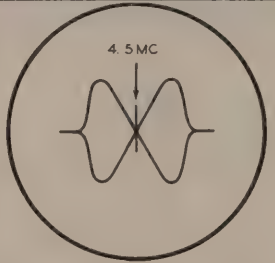


FIG. 3

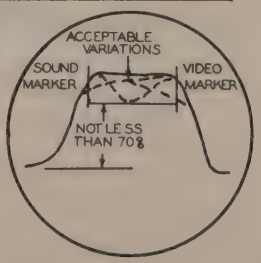


FIG. 4

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Complete oscillator alignment may not be necessary.

If the oscillator seems to be off frequency approximately the same amount, for a majority of the channnels, it may be possible to correct them in one step using A12. If should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel.

If adjustment of A12 will not bring all channels within the range of the fine tuning control it will be necessary to use the individual channel oscillator adjustments for each channel that is off frequency (step 8).

The individual channel oscillator adjustments are reached through a hole just to the right of the channel switch shaft.

The correct adjustment screw is accessible through this hole as the channel selector is turned to each channel.

Set the fine tuning control to the mid-position of its range.

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point (A). Low side to chassis.	A13	Adjust to place sound markers as shown in Fig 5. The video marker should be at 50%.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A14	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A15	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A16	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A17	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A18	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A19	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A20	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A21	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A22	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A23	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A24	

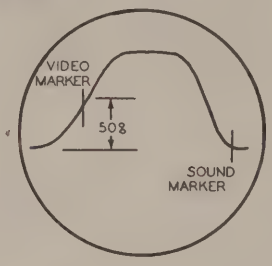
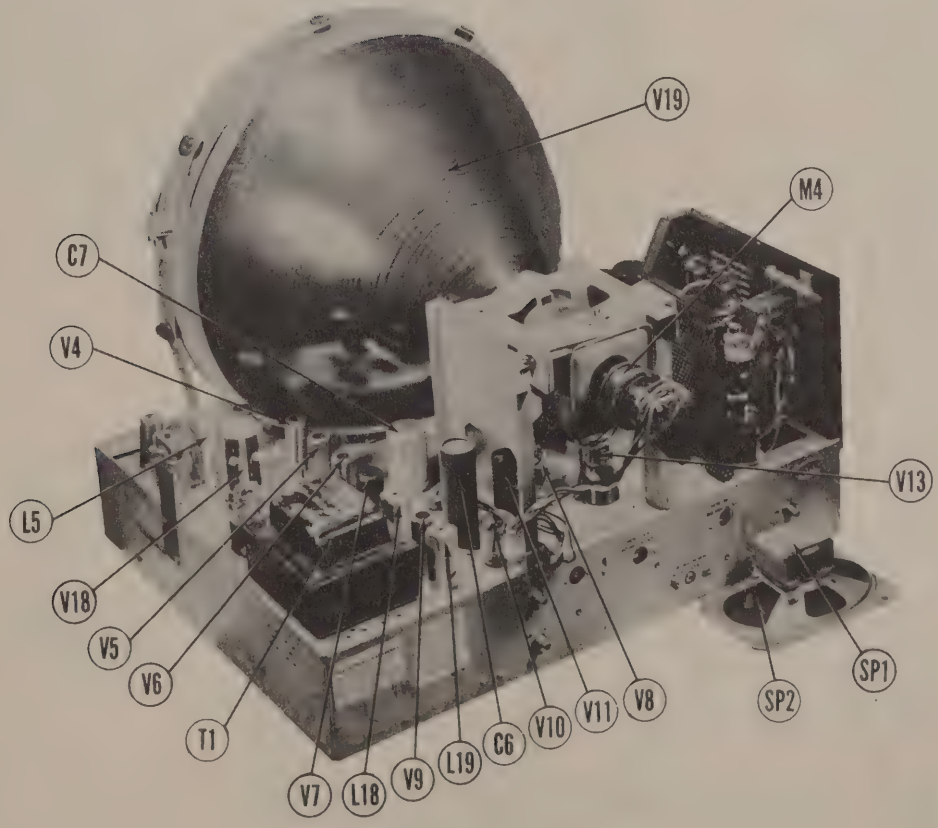


FIG. 5



CHASSIS-TOP VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.4VDC	0V.	6.3VAC	0V.	100VDC	100VDC	0V.		
V 2	6J6	90VDC	80VDC	6.3VAC	0V.	§-1.8VDC	-2.5VDC	0V.		
V 3	6AU6	-.2VDC	0V.	0V.	6.3VAC	133VDC	133VDC	.8VDC		
V 4	6AU6	-.2VDC	0V.	0V.	6.3VAC	133VDC	133VDC	.7VDC		
V 5	6AU6	0V.	0V.	0V.	6.3VAC	135VDC	135VDC	.9VDC		
V 6	6AL5	2.4VDC	-2.9VDC	0V.	6.3VAC	-2.7VDC	0V.	-.1VDC	155VDC	
V 7	6AC7	0V.	6.3VAC	.1VDC	-2.7VDC	.1VDC	173VDC	0V.		
V 8	12AU7	100VDC	-.4VDC	0V.	6.3VAC	6.3VAC	6.6VDC	0V.	1.6VDC	0V.
V 9	6AU6	†6VDC	†10VDC	6.3VAC	†0V.	205VDC	105VDC	10VDC		
V 10	6T8	†-.4VDC	†-.6VDC	†-.4VDC	†0V.	†6.3VAC	0V.	†0V.	†-.4VDC	†85VDC
V 11	6V6GT	†-5.4VDC	†6.3VAC	†177VDC	†270VDC	†-.4VDC	†-.1VDC	†0V.	†0V.	
V 12	6SN7GT	-30VDC	60VDC 130VDC	0V.	0V.	400VDC	8VDC 20VDC	6.3VAC	0V.	
V 13	6SN7GT	-15VDC	155VDC	0V.	-30VDC	170VDC	0V.	6.3VAC	0V.	
V 14	6BG6G	0V.	0V.	12VDC	280VDC	0V.	0V.	6.3VAC	280VDC	TOP CAP *
V 15	5V4G	0V.	390VDC	340VDC	340VDC	390VDC	340VDC	320VDC	390VDC	
V 16	1B3GT	* DO NOT MEASURE.								
V 17	1B3GT	* DO NOT MEASURE.								
V 18	5U4G	0V.	410VDC	0V.	420VAC	0V.	420VAC	0V.	410VDC	
V 19	16DP4	6.3VAC	1.3VDC	PIN 10 340VDC	PIN 11 25VDC	PIN 12 0V.				

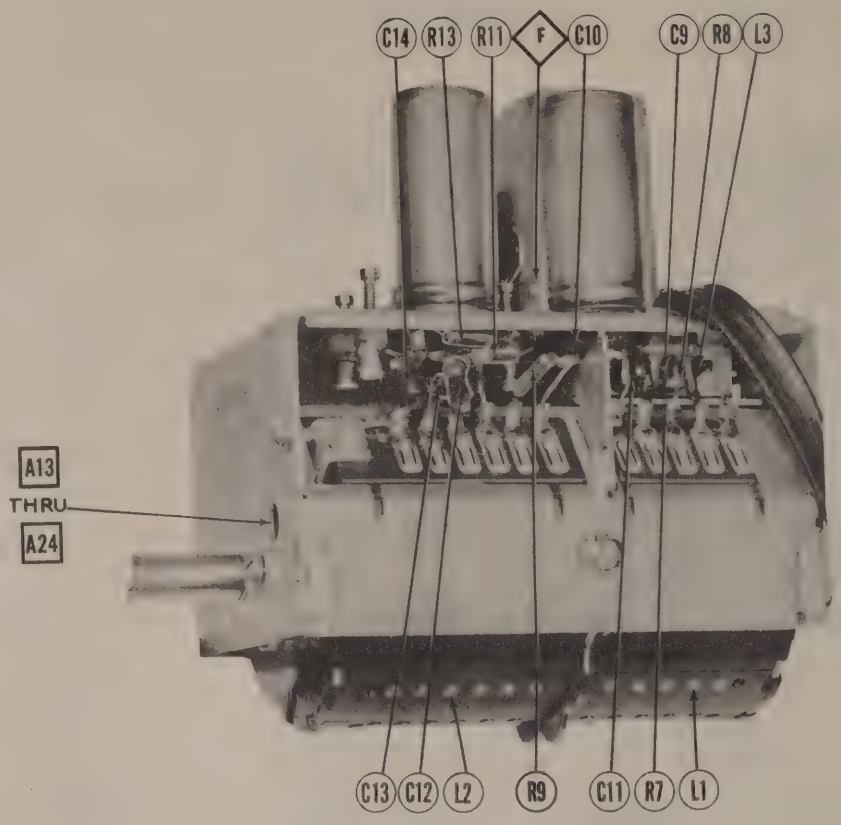
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.
† MEASURED FROM PIN 8 OF V11.

RESISTANCE READINGS

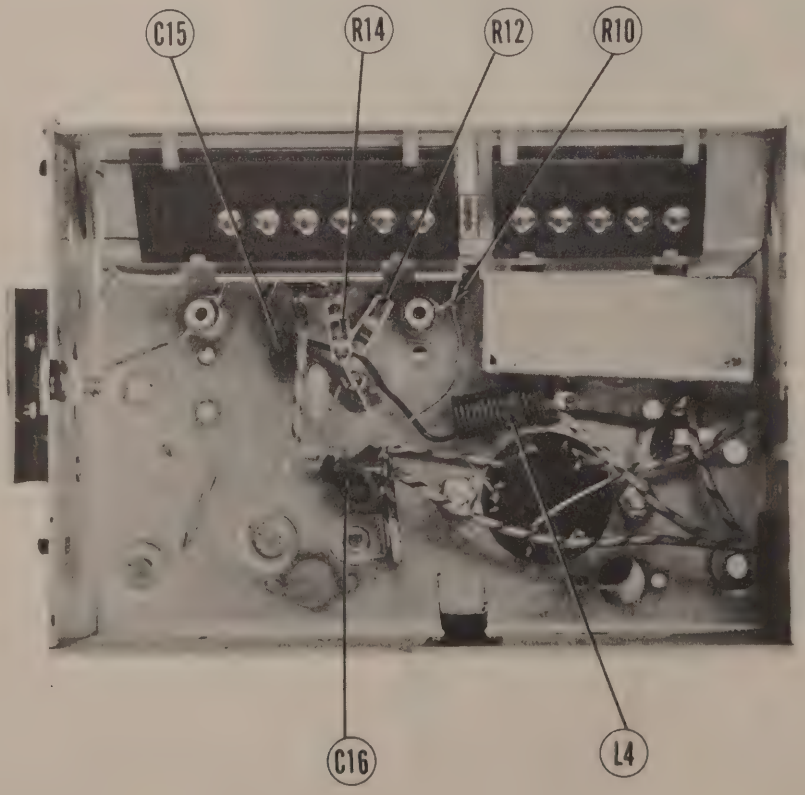
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	1 Meg.	0Ω	.1Ω	0Ω	†3.2KΩ	†3.2KΩ	0Ω		
V 2	6J6	†5.7KΩ	†16KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6AU6	1.2 Meg.	0Ω	0Ω	.1Ω	†300Ω	†300Ω	82Ω		
V 4	6AU6	1.2 Meg.	0Ω	0Ω	.1Ω	†200Ω	†200Ω	82Ω		
V 5	6AU6	.2Ω	0Ω	0Ω	.1Ω	†100Ω	†100Ω	82Ω		
V 6	6AL5	750Ω	1000Ω	0Ω	.1Ω	9.2KΩ	0Ω	600KΩ		
V 7	6AC7	0Ω	.1Ω	8Ω	9.3KΩ	8Ω	22KΩ	0Ω	†5.6KΩ	
V 8	12AU7	†3.3KΩ	1 Meg.	0Ω	.1Ω	.1Ω	47KΩ	0Ω	240KΩ	0Ω
V 9	6AU6	†47KΩ	†1000Ω	†.1Ω	†0Ω	#1.2KΩ	#16KΩ	†1000Ω		
V 10	6T8	Inf.	†47KΩ	Inf.	†0Ω	†.1Ω	Inf.	†0Ω	†470KΩ	#330KΩ
V 11	6V6GT	0Ω	†.1Ω	#1000Ω	#60Ω	200KΩ	†3.3KΩ	†0Ω	†0Ω	
V 12	6SN7GT	2.3 Meg.	3 Meg. 1.5 Meg.	0Ω	2.2 Meg.	#3.3KΩ	5.5KΩ 560Ω	.1Ω	0Ω	
V 13	6SN7GT	950KΩ	#75KΩ	300KΩ	250KΩ	#140KΩ	0Ω	.1Ω	0Ω	
V 14	6BG6G	Inf.	0Ω	100Ω	#5KΩ	1 Meg.	1 Meg.	.1Ω	#4.8KΩ	TOP CAP #30KΩ
V 15	5V4G	Inf.	#25KΩ	#300Ω	#300Ω	#25KΩ	#300Ω	#700KΩ	#25KΩ	
V 16	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #25KΩ
V 17	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP Inf.
V 18	5U4G	Inf.	15KΩ	Inf.	79Ω	Inf.	75Ω	Inf.	15KΩ	
V 19	16DP4	.1Ω	240KΩ	PIN 10 #1.2KΩ	PIN 11 25KΩ	PIN 12 0Ω				

† MEASURED FROM PIN 8 OF V11.
# MEASURED FROM PIN 2 OF V18.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

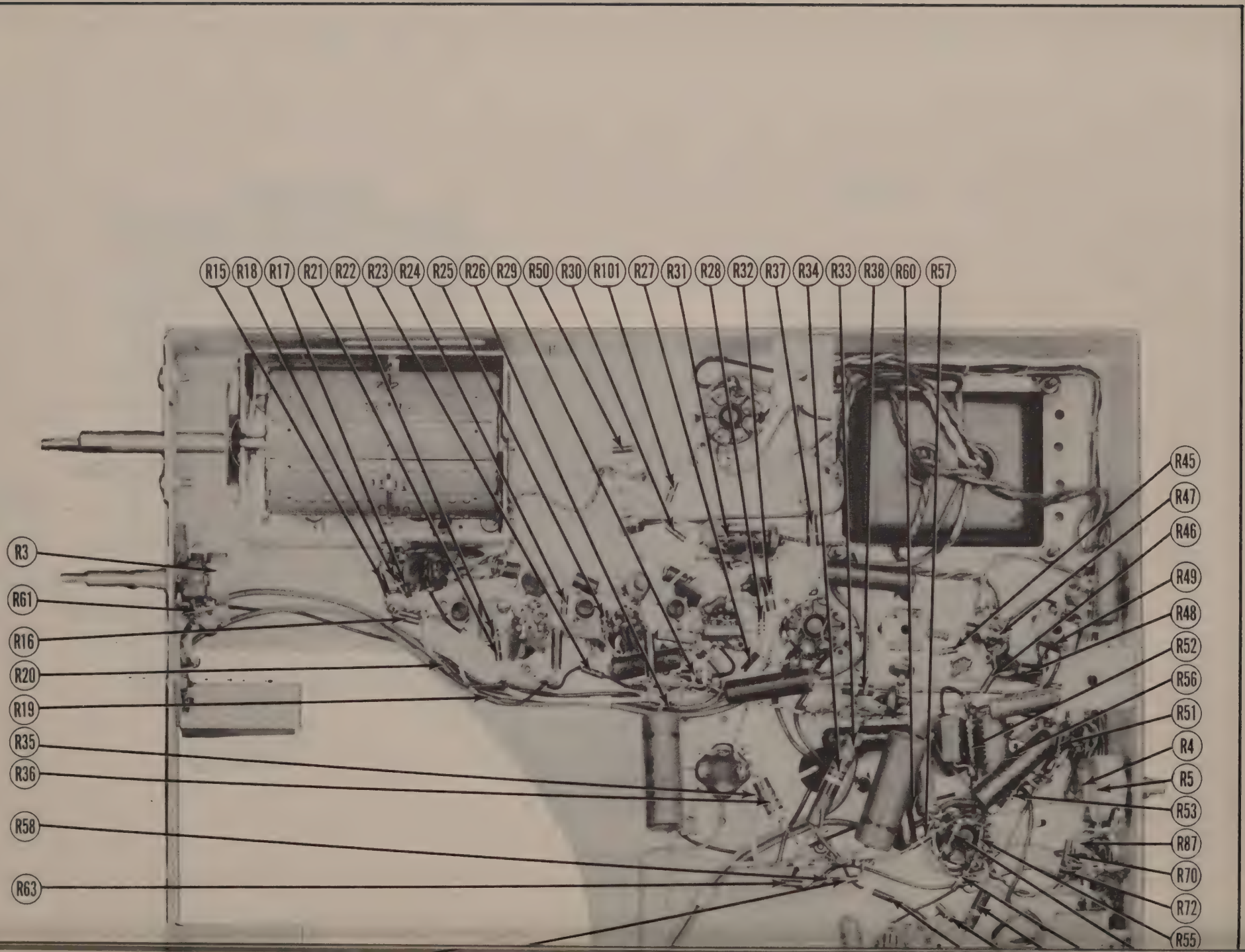


RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION


R15
R18
R17
R21
R22
R23
R24
R25
R26
R29
R50
R30
R101
R27
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R32
R37
R34
R33
R38
R60
R57
R3
R61
R16
R20
R19
R35
R36
R58
R63
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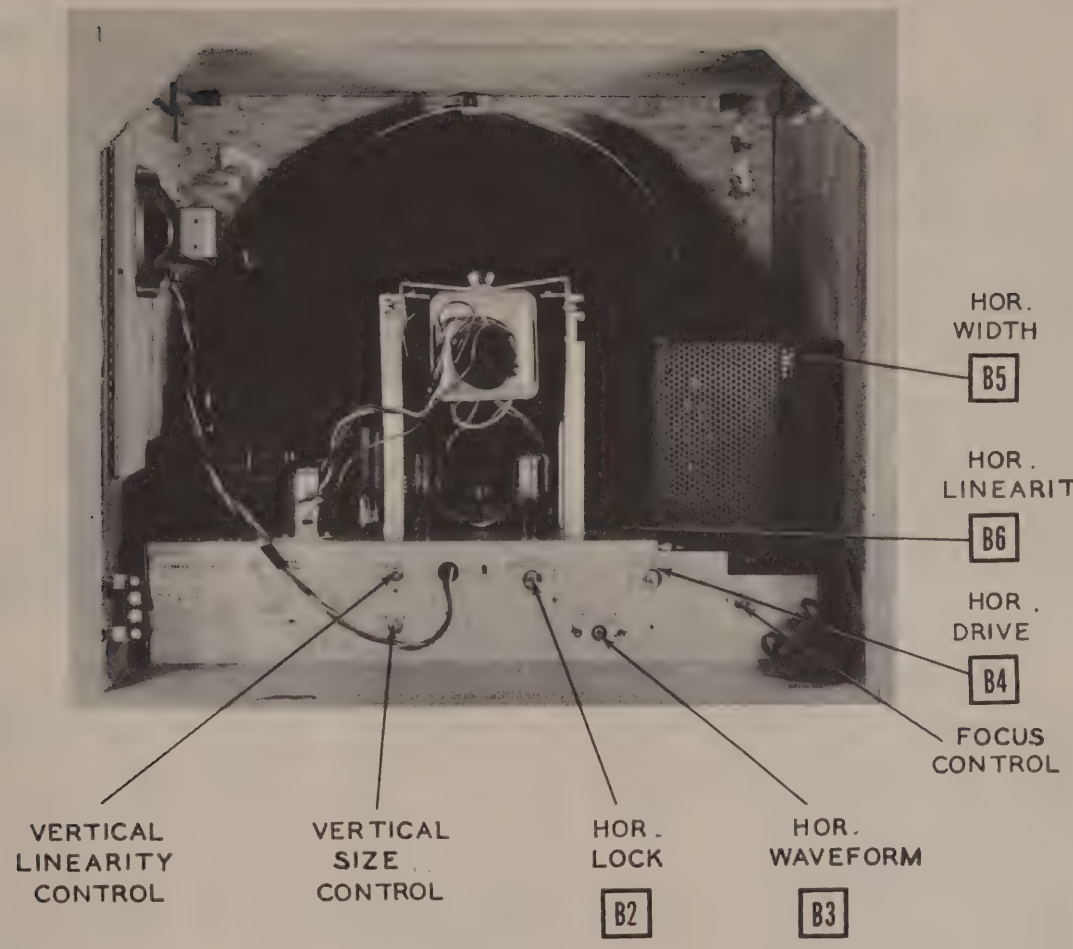
R87
R70
R72
R55



CABINET-REAR VIEW

HORIZONTAL OSCILLATOR CIRCUIT ADJUSTMENTS

HORIZONTAL FREQUENCY ADJUSTMENT

Turn the set on and tune in a TV station, preferably a test pattern.
Connect a short circuit across terminals C and D of L20.
Turn the horizontal hold control to the extreme clockwise position and adjust the horizontal frequency slug (B1) until the horizontal blanking shows in the picture as a single vertical bar. Remove the short from L20.
Turn the horizontal hold control approximately 1/4 turn counter-clockwise, the picture should sync normally. If the picture does not synchronize properly, proceed with complete horizontal oscillator alignment.

COMPLETE HORIZONTAL OSCILLATOR ALIGNMENT

Connect a short circuit across terminals C and D of L20.
Turn the horizontal hold control to maximum counter-clockwise, the picture should remain in sync.
Momentarily interrupt the signal by switching to another channel and back again.
Slowly turn the horizontal hold control clockwise and carefully note the least number of bars present just before the picture pulls into sync. If more than 9 bars are present, turn the horizontal lock trimmer (B2) 1/2 turn clockwise; if less than 7 are present, turn (B2) 1/2 turn counter-clockwise.
Repeat this procedure until 7 to 9 bars are present just before the picture pulls into sync.
Remove the short from L20 and turn the horizontal hold control if necessary, to synchronize the picture.
Connect a low capacity probe of an oscilloscope to terminal "C" of L20. Adjust the waveform adjustment slug (B3) until the broad and narrow peaks of the pattern are of equal height as shown in figure 6. If necessary during this adjustment turn the horizontal hold control to keep the picture in synchronism.

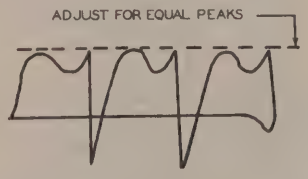


FIG. 6

HORIZONTAL WIDTH AND LINEARITY ADJUSTMENT

Turn the horizontal drive trimmer (B4) clockwise as far as possible without crowding the right half of the picture.
Adjust the width slug (B5) until the picture fills the mask horizontally.
Adjust the horizontal linearity slug (B6) until the picture is symmetrical from left to right.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Converter	6J8	6J6	7BF	
V3	1st Video IF	6AU6	6AU6	7BK	
V4	2nd Video IF	6AU6	6AU6	7BK	
V5	3rd Video IF	6AU6	6AU6	7BK	
V6	Video Det.-AGC Rectifier	6AL5	6AL5	6BT	
V7	Video Amp.	6AC7	6AC7	8N	
V8	DC Restorer-Sync. Sep.-Sync. Amp.	12AU7	12AU7	9A	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Det.-AF Amp.	6T8	6T8	9E	
V11A	Audio Output	6V6	6V6	7AC	
B	Audio Output	6V6GT	6V6GT	7AC	
V12	Vert. Osc.-Vert. Amp.	6SN7GT	6SN7GT	8BD	
V13	Hor. AFC-Hor. Osc	6SN7GT	6SN7GT	8BD	
V14	Hor. Output	6BG6G	6BG6G	5BT	
V15	Damper	5V4G	5V4G	5L	
V16	HV Rectifier	1B3GT	1B3GT	3C	
V17	HV Rectifier	1B3GT	1B3GT	3C	
V18	LV Rectifier	5U4G	5U4G	5T	
V19A	Picture Tube	16DP4	16DP4	12D	
B	Picture Tube	15AP4	15AP4	12G	
C	Picture Tube	15CP4	15CP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: VIDEOLA PART No	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	80	300		AF16G			Filter
C2	80	300		AF16G			Filter
C3A	40	500		AF88K		TVL-20	● Filter
B	40	500					▲ Filter
C4	100 ▲						
	30 ■	3		PRS6/500			Bias Filter
C5A	50	250		AF10F20B			● Filter
B	100	50					▲ Vert. Output Cathode Bypass
C6	40	450		AF8J		TVL-45	Output Plate Decoupling
C7A	10	450		AF2222J		TVL-39	● Decoupling
B	10	450					■ Vert. Osc. Decoupling
C	10	450					▲ Vert. Amp. Screen Bypass
D	10	450					Vert. Output Plate Decoupling
C8	2	50		PRS150/4		TVA-12	Stabilizing Cap.
C9	5			CN5DNPO	NPOK-5		Fixed Trimmer
C10	120			GP120M	GPIK-120		RF Decoupling
C11	1000			GP1000M			RF Filament Bypass
C12	100			GP100M	GPIK-100		RF Coupling
C13	20			CN20JNPO	NPOK-20		Osc. Grid Cap.
C14	10			CN10DNPO	NPOK-10		Fixed Trimmer
C15	1000			GP1000M	GP2L-001	29C4	Conv. Filament Bypass
C16	GP1000M			GP1000M	GP2L-001		RF Bypass
C17	5000			BPD-5	811-005	29C1	AGC Filter
C18	5000			BPD-5	811-005	29C1	1st V. IF Decoupling
C19	5000			BPD-5	811-005	29C1	1st V. IF Fil. Bypass
C20	100	500		1468-0001	GPIK-100	1FM-31	IF Coupling
C21	5000			BPD-5	811-005	29C1	AGC Filter
C22	5000			BPD-5	811-005	29C1	2nd V. IF Decoupling
C23	5000			BPD-5	811-005	29C1	2nd V. IF Fil. Bypass
C24	100	500		1468-0001	GPIK-100	1FM-31	IF Coupling
C25	5000			BPD-5	811-005	29C1	3rd V. IF Decoupling
C26	5000			BPD-5	811-005	29C1	3rd V. IF Cath. Bypass
C27	5000			BPD-5	811-005	29C1	3rd V. IF Fil. Bypass
C28	100	500		[illegible]	GPIK-100	1FM-31	IF Coupling
C29	100	500		1468-0001	GPIK-100	1FM-31	IF Coupling
C30	.01	400		P488-01	821-01	TM-11	DAGC Decoupling
C31	.05	200		P288-05		TM-15	AGC Filter
C32	5			GP5K	NPOK-5	MS-55	V. Diode Filter
C33	5000			BPD-5	811-005	29C1	V. DET-AGC Fil. Bypass
C34	5000			BPD-5	811-005	29C1	Bias Filter
C35	.01	400		P488-01	821-01	TM-11	Bias Filter
C36	300	500		1468-0003	GP2K-300	MS-33	V. Amp. Cath. Bypass †
C37	100	500		[illegible]	GPIK-100	1FM-31	V. Amp. Cath. Bypass ‡
C38	.1	600		P688-1		TM-1	Video Coupling
C39	.1	600		[illegible]		TM-1	Pic. Tube Cath. Decoupling
C40	22			GP22M	GPIK-22	MS-425	Sync. Sep. Plate Bypass
C41	39			GP39M	GPIK-39	1FM-44	S. IF Coupling
C42	.02	600		P688-02		TM-12	RF Bypass
C43	5000			BPD-5	811-005	29C1	S. IF Screen Bypass
C44	.022	600		[illegible]		TM-12	S. IF Decoupling
C45	.001	400		P688-001	GP2L-001	TM-21	Diode Load Cap.
C46	3900	500		1467-004		1FM-24	De-emphasis
C47	.05	200		P288-05		TM-15	Audio Coupling
C48	5000			BPD-5	811-005	29C1	Audio Coupling
C49	.02	600		P688-02		TM-12	Audio Coupling
C50	.05	200		P288-05		TM-15	Bias Filter
C51	.005	600		[illegible]	811-005	TM-25	Output Plate Bypass
C52	.01	200		P488-01	821-01	TM-11	Sync. Coupling
C53	.002	400		[illegible]	GP2M-002	TM-22	Integrator Net.
C54	.005	400		[illegible]	811-005	TM-25	Integrator Net.
C55	.005	400		[illegible]	811-005	TM-25	Integrator Net.
C56	4700	500		[illegible]	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C57	.1	600		P688-1		TM-1	Vert. Discharge
C58	.25	400		P488-25		TC-2	Vert. Sweep Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C59	180	500		1468-0002	GP2K-180	1FM-32	Hor. Sync. Coupling
C60	.0022	600		P688-0022	GP2M-0022	TM-22	Hor. Sync. Coupling
C61	5	1500					Hor. Feedback
C62	.022	600		P688-022		TM-12	AFC Filter
C63	.22	400		P488-22		TC-2	AFC Filter
C64	.047	600		P688-047		TM-15	AFC Plate Bypass
C65	180	500		1468-0002	GP2K-180	1FM-32	Hor. Osc. Grid Cap.
C66	.01	600		P688-01		TM-11	Fixed Trimmer
C67	.0022	600		P688-0022	GP2M-0022	TM-22	Hor. Discharge
C68	580	500		1468-0005	GP2K-560	MS-36	Hor. Sweep Coupling
C69	.047	1000		P1088-047		TR-15	Hor. Output Screen Bypass
C70	330	500		1468-00035	GP2K-330	1FM-335	Hor. Output Screen Bypass
C71	.22	400		P488-22		TC-2	Hor. Output Cath. Bypass
C72	.033	1000		P1088-033			Damper Filter
C73	.047	1000		P1088-047		TR-15	Damper Filter
C74	.25	200		P488-25		TC-2	Hor. Sweep Coupling
C75	300	500		1469-0003	GP2K-300	MS-33	Fixed Trimmer *
C76	500	10000			410-500		Voltage Doubler Cap. *
C77	500	10000			410-500		HV Filter
C78	500	10000			410-500		HV Filter *
C79	.01	400		P488-01	821-01	TM-11	Line Filter
C80	.01	400		P488-01	821-01	TM-11	Line Filter
C81	.01	400		P488-01	821-01	TM-11	Vert. Discharge *
C82	.001	400		P688-001	GP2L-001	TM-21	Diode Load Cap. *
C83	.01	600		P688-01	821-01	TM-11	Acc. Anode Bypass *

* Not used in all models.
† Some models use 680MMF in this application.
‡ Some models use 470MMF in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	INSTALLATION NOTES
R1A	1 Meg.			Bil-137 *		Vert. hold control, panel
B	50KΩ			Bil-123 *	970111-8	Horiz. hold control, rear
C	Shaft End			E187 *		Attach per instructions in "Concentrikit".
R2A	250KΩ	½		Q13-130	M-64-Z	Volume control
B	Switch			76-1	SW-A	Attach to R2A per instructions
R3A	750Ω					Contrast control, tapped at 500Ω
B	100KΩ			Q11-114	M-19-S	Brightness control
R4	5000Ω					Vert. linearity control
R5	3.2Meg.			Q11-239		Vert. size control
R6	1750Ω	4				Focus control, Wire Wound-See Note 1

* Additional parts to be used with "Concentrikit".
Note 1. Late productions models use 10KΩ, 4 watt, Wire Wound control in this application.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 20% UNLESS OTHERWISE STATED.
R7	3900Ω 10%	½		BTS-3900	RF Grid
R8	47KΩ 10%	½		BTS-47K	AGC Network
R9	10KΩ 10%	½		BTS-10K	RF Plate Coil Shunt
R10	2200Ω	½		BTS-2200	RF Decoupling
R11	4700Ω 10%	½		BTS-4700	Conv. Grid
R12	220KΩ	½			Conv. Grid
R13	10KΩ 10%	½		BTS-10K	Osc. Grid
R14	4700Ω 10%	½		BTS-4700	Osc. Plate
R15	1 Meg.	½		BTS-1 Meg.	AGC Network
R16	1 Meg.	½		BTS-1 Meg.	AGC Network
R17	4700Ω	½		BTS-4700	1st Video IF Grid-See Note 2
R18	82Ω 10%	½			1st Video IF Cathode
R19	100Ω	½			1st Video IF Decoupling
R20	330Ω	½			AGC Network
R21	8200Ω 10%	½			2nd Video IF Grid
R22	82Ω 10%	½			2nd Video IF Cathode
R23	100Ω	½			2nd Video IF Decoupling
R24	8200Ω 10%	½			3rd Video IF Grid Coil Shunt-See Note 2
R25	82Ω 10%	½			3rd Video IF Cathode
R26	100Ω	½			3rd Video IF Decoupling
R27	2.2 Meg.	½		BTS-2.2 Meg.	AGC Network
R28	680KΩ	½		BTS-680K	AGC Rect. Diode Load
R29	39KΩ 10%	1		BTA-39K	Voltage Divider
R30	1000Ω	½		BTS-1000	Bias Network
R31	8200Ω 10%	½		BTS-8200	Video Det. Diode Load
R32	120Ω 10%	2			Parasitic Supp.
R33	51KΩ 10%	2			Video Amp. Plate
R34	56KΩ 10%	2		BT-2-56K	Video Amp. Plate
R35	43KΩ 5%	2			Video Amp. Screen
R36	43KΩ 5%	2			Video Amp. Screen
R37	22KΩ	1		BTA-22K	Voltage Divider
R38	5600Ω 10%	1		BTA-5600	Voltage Divider
R39	2200Ω	½		BTS-2200	Picture Tube Grid
R40	240KΩ 5%	½			DC Rest. Load
R41	47KΩ	½		BTS-47K	DC Rest. Load
R42	820KΩ 10%	½		BTS-820K	Voltage Divider
R43	1 Meg.	½		BTS-1 Meg.	Sync. Amp. Grid
R44	3300Ω 10%	1		BTA-3300	Sync. Amp. Plate
R45	47KΩ	½			Sound IF Grid
R46	1000Ω	½		BTS-1000	Sound IF Cathode
R47	33KΩ 10%	1		BTA-33K	Voltage Divider-See Note 13
R48	22KΩ	2			Sound IF Screen-See Note 12
R49	1000Ω	½		BTS-1000	Sound IF Decoupling
R50	1000Ω	½		BTS-1000	Decoupling
R51	47KΩ	½		BTS-47K	Ratio Det. Diode Load
R52	15KΩ	½		BTS-15K	De-emphasis

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R53	470KΩ	½		BTS-470K	AF Grid-See Note 11
R54	470KΩ	½		BTS-470K	Voltage Divider-See Note 4
R55	3300Ω	½		BTS-3300	Voltage Divider
R56	330KΩ	½		BTS-330K	AF Plate-See Note 10
R57	100KΩ	½		BTS-100K	Output Grid
R58	300KΩ 5%	½			Voltage Divider
R59	160KΩ 5%	½			Voltage Divider
R60	390Ω 10%	2		BW-2-390	Filter
R61	27KΩ 10%	½		BTS-27K	Voltage Divider
R62	240KΩ 5%	½			Voltage Divider
R63	1000Ω	½		BTS-1000	Acc. Anode Decoupling-See Note 9
R64	22KΩ 5%	½		BTS-22K-5%	Integrator
R65	8200Ω 10%	½		BTS-8200	Integrator
R66	8200Ω 10%	½		BTS-8200	Integrator
R67	1.2 Meg. 10%	½		BTS-1.2 Meg.	Vert. Osc. Grid
R68	6.8 Meg.	½		BTS-6.8 Meg.	Voltage Divider
R69	100KΩ	½		BTS-100K	Voltage Divider
R70	1.5 Meg.	½		BTS-1.5 Meg.	Vert. Osc. Plate
R71	2.2 Meg.	½		BTS-2.2 Meg.	Vert. Amp. Grid
R72	560Ω 10%	½		BTS-560	Vert. Amp. Cathode
R73	3300Ω	½		BTS-3300	Vert. Peaking
R74	3300Ω	½		BTS-3300	Vert. Amp. Decoupling
R75	820KΩ 5%	½		BTS-820K-5%	Horiz. AFC Grid
R76	150KΩ 10%	½		BTS-150K	Horiz. AFC Cathode
R77	150KΩ 5%	1		BTA-150K-5%	Horiz. AFC Cathode
R78	8200Ω 10%	½		BTS-8200	Horiz. AFC Filter Network
R79	2.7 Meg. 5%	1		BTA-2.7 Meg. 5%	Voltage Divider
R80	68KΩ 10%	½		BTS-68K	Voltage Divider
R81	120KΩ 10%	1		BTA-120K	Voltage Divider
R82	150KΩ 10%	½		BTS-150K	Horiz. AFC Filter Network
R83	100KΩ 5%	1		BTA-150K	Horiz. Osc. Grid
R84	8200Ω 10%	½		BTS-8200	Horiz. Osc. Transformer Shunt
R85	22KΩ 5%	½		BTS-22K-5%	Horiz. Osc. Transformer Shunt
R86	100KΩ 10%	1		BTA-100K	Horiz. Osc. Plate
R87	56KΩ 10%	½		BTS-56K	Filter
R88	10KΩ 10%	½		BTS-10K	Filter
R89	68Ω 10%	½			Parasitic Supp.
R90	1 Meg.	½		BTS-1 Meg.	Horiz. Output Grid
R91	100Ω 5%	2		BW-2-100	Horiz. Output Cathode
R92	4700Ω	2		BT-2-4700	Horiz.Output Screen-See Note 8
R93	30KΩ 10%	50		EP-30,000	Damper Filter-Wire Wound
R94	4.7Ω	1			HV Rect. Filament -See Note 4
R95	4.7Ω	1			HV Rect. Filament -See Note 4
R96	180KΩ 10%	2			HV Rect. Load-See Note 6 and 4
R97	180KΩ 10%	2			HV Rect. Load-See Note 6 and 4
R98	180KΩ 10%	2			HV Rect. Load-See Note 6 and 4
R99	560KΩ 10%	½		BTS-150K	Feedback
R100	680KΩ	1			HV Filter
R101	12Ω 10%	½		BW-½-12	Bias Network
R102	150Ω 10%	10		AB-150	Filter-Wire Wound-See Note 3
R103	1000Ω 10%	10		AB-1000	Focus Coil Shunt-Wire Wound-See Notes 4 and 14
R104	220Ω	2		BW-2-220	Focus Coil Shunt
R105	22KΩ	2		BT-2-22K	Bleeder-See Note 5
R106	22KΩ	2		BT-2-22K	Bleeder-See Note 5
R107	3300Ω 10%	10			Series Focus Coil-Wire Wound-See Note 3
R108	68Ω	½			Balancing-See Note 7
R109	47Ω	½		BW-½-47	Feedback-See Note 7
R110	6000Ω	20		DG-6000	Voltage Divider-See Note 7
R111	10Ω	½		BW-½-10	AF Cathode-See Note 7

Note 2. Some models use 5600Ω resistor in this application.
Note 3. Used in late production models only.
Note 4. Not usedin all models.
Note 5. Some models use 27KΩ, 2 watt resistor in this application.
Note 6. In some models item R96, R97 and R98 may be replaced by one **2 Meg.**, 4 watt resistor.
Note 7. Used only in late models.
Note 8. Late models use 27KΩ, 2 watt resistor in this application.
Note 9. Late models use 100KΩ resistor in this application.
Note 10. Late models use 150KΩ, 1 watt resistor in this application.
Note 11. Late models use 4.7 Meg. resistor in this application.
Note 12. Late models use 100KΩ resistor in this application.
Note 13. Late models use 27KΩ resistor in this application.
Note 14. Late models use 1200Ω resistor in this application.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	65Ω	3.3Ω			46E65S	
	CONE DIA.	V. C. DIA.				
SP2	3 7/8" x 5 7/8"	9/16"				

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: VIDEOLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC @ 1.98A	850VCT .230ADC @ 3A	5VAC @ 2A	5VAC @ 2A			P-3067	TP-383
		SEC. 4	SEC. 5					
		6.3VAC @ 6A	6.3VAC @ 1.2A					

VIDEOLA MODELS VS-160, VS-161, VS-165, VS-166, VS-167, VS-168

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	DC RESISTANCE		VIDEOLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.					
T2	158Ω	1280Ω		A-8121	A-4000	TBO-1	Vert. Block Osc. Trans.
T3A	100Ω Tap	SEC. 1		A-8119	HVO5	TFB-4	Hor. Output Trans.
	② 22Ω	10.6Ω Tap					
		② .6Ω					
		SEC. 2					
		0Ω					
		SEC. 3					
		0Ω					
B			③				Hor. Output Trans.
T4	570Ω	7.2Ω		A-8116	A-3035	TSO-4	Vert. Output Trans.
T5A	13.5Ω			DY-1	MD1		Hor. Deflection Coil
B	60Ω						Vert. Deflection Coil
T6	275Ω			FC-10	MF1		Focus Coil

③ Hor. output transformer of the GE type used in some models.

TRANSFORMER (AUDIO OUTPUT)

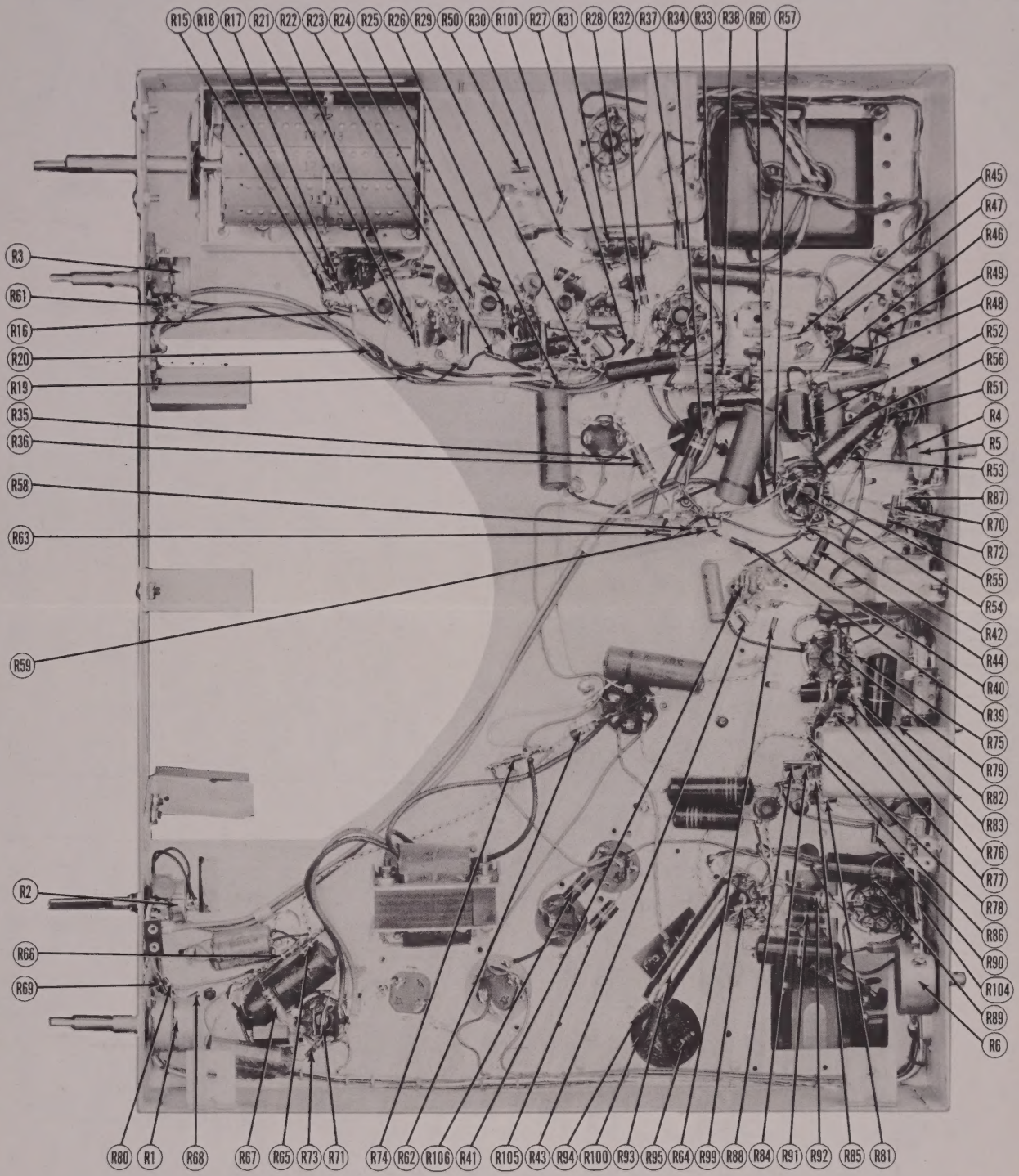
ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		VIDEOLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T7	5.4KΩ	3.3Ω	390Ω	.2Ω		A-3877	A-2930	RO-9 ①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	VIDEOLA PART No.	MEISSNER PART No.	
L1	Ant. Coils	0Ω				Part of tuner.
L2	RF, Mixer & Osc. Coils	0Ω				Part of tuner.
L3	Fil. Choke	0Ω				Part of tuner.
L4	Fil. Choke	0Ω				Part of tuner.
L5	1st Video IF	.2Ω	.2Ω			Part of tuner.
L6	Fil. Choke	0Ω				
L7	2nd Video IF	.2Ω				
L8	Fil. Choke	0Ω				
L9	Plate Choke	2.2Ω				
L10	3rd Video IF	.2Ω				
L11	Fil. Choke	0Ω				
L12	Plate Choke	2.2Ω				
L13	4th Video IF	.2Ω				
L14	Peaking	5Ω				
L15	Peaking	12Ω				
L16	Peaking	8Ω				Wound on 18KΩ resistor.
L17	Peaking	10Ω				
L18	Sound IF	1.8Ω	1.8Ω			
L19	Ratio Det. Trans.	4Ω	2Ω			
L20	Hor. Osc. Trans.	130Ω	36Ω			
L21	Width Cont.	.1Ω				
L22	Hor. Linearity	36Ω				
L23	Fil. Choke	0Ω				

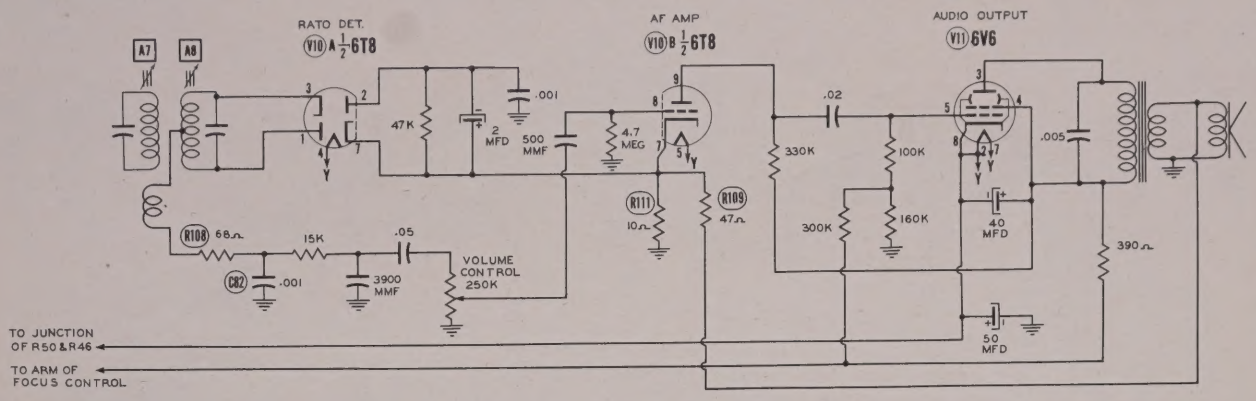
MISCELLANEOUS

ITEM No.	PART NAME	VIDEOLA PART No.	NOTES
M1	RF Tuner		Standard Coil
M2	Fuse		Type AGC, .25A
M3	Fuse		5A., 250V
M4	Ion Trap		Permanent Magnet Type
	Trimmer		Horiz. Locking Range (25-280MMF)
	Trimmer		Horiz. Drive (25-280MMF)

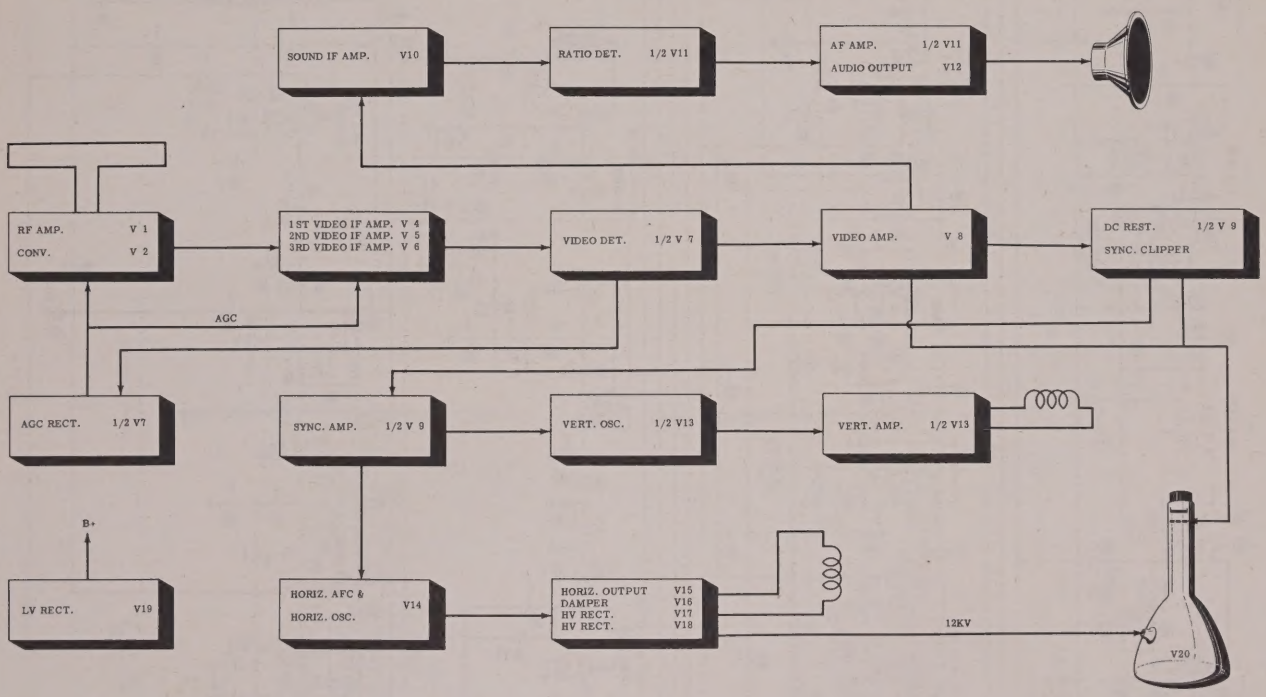


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

VIDEOLA MODELS VS-160, VS-161,
VS-165, VS-166, VS-167, VS-168



ALTERNATE AUDIO CIRCUIT



BLOCK DIAGRAM